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Final Report

Improving the German Climate Adaptation Strategy

Final report of the project "Network of Authorities for Climate Change and Adaptation – Methods to Support and Improve the German Climate Adaptation Strategy"

by:

Linda Hölscher, Walter Kahlenborn, Elena Eckhardt
adelphi research gGmbh, Berlin

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On behalf of the German Environment Agency

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Tel: +49 340-2103-0
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buergerservice@uba.de
Internet: www.umweltbundesamt.de

Report performed by:
adelphi research gGmbH
Alt-Moabit 91
10559 Berlin
Germany

Leibniz Institute of Ecological Urban and Regional Development
Weberplatz 1
01217 Dresden
Germany

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Abstract: Improving the German Climate Adaptation Strategy

This report identifies optimisation potential for the processes and institutions of climate adaptation policy in Germany using different methodological analytical approaches and derives recommendations for the further development of the German Adaptation Strategy (DAS) and related processes.

A methodological analysis of policy design reveals that policy design research provides useful indications through the systematic elaboration of a typology of types of policy mix, which has not yet been comprehensively considered in the elaboration of action plans in climate adaptation. Furthermore, on the basis of a comparative policy field analysis of different strategy processes in Germany, starting points for the further development of the Network of Authorities for Climate Change and Adaptation can be identified. An important component in this context is the development of a clear objective and a common self-conception of the network cooperation as well as the communication of this, both internally and externally.

Key recommendations for the further development of the DAS and its processes include expanding the scope of stakeholder participation in the selection process of adaptation measures and the use of an integrative policy design approach. In addition, a further development of stakeholder involvement processes, for example through the establishment of a stakeholder forum with associated working processes, is advocated, and a (vertical) integration of different levels through a possible inclusion of the federal state level as well as a clearly defined objective for the planning of measures is recommended.

Kurzbeschreibung: Improving the German Climate Adaptation Strategy

Der vorliegende Bericht identifiziert anhand verschiedener methodischer Analyseansätze Optimierungspotentiale für die Prozesse und Institutionen der Klimaanpassungspolitik in Deutschland und leitet daraus Empfehlungen für die Weiterentwicklung der Deutschen Anpassungsstrategie (DAS) und damit zusammenhängender Prozesse ab.

Eine Methodenanalyse zum Policy Design zeigt, dass die Policy-Design-Forschung nützliche Hinweise durch die systematische Erarbeitung einer Typologie von Arten eines Policy Mix liefert, welche bislang nicht umfassende Berücksichtigung in der Erarbeitung von Maßnahmenplänen in der Klimaanpassung fand. Zusätzlich lassen sich auf Basis einer vergleichenden Politikfeldanalyse verschiedener Strategieprozesse in Deutschland Ansatzpunkte für die Weiterentwicklung des Behördennetzwerks Klimawandel und Anpassung ausmachen. Eine wichtige Komponente ist in diesem Zusammenhang die Entwicklung einer klaren Zielsetzung und eines gemeinsamen Selbstverständnisses der Netzwerkzusammenarbeit sowie die Kommunikation davon sowohl nach innen als auch nach außen.

Zentrale Empfehlungen für die Weiterentwicklung der DAS und deren Prozesse umfassen dabei u.a. die Erweiterung des Umfangs der Akteursbeteiligung im Auswahlprozess von Anpassungsmaßnahmen und die Verwendung eines integrativen Ansatzes der Politikgestaltung. Zusätzlich wird eine Weiterentwicklung von Prozessen der Akteurseinbindung, beispielsweise durch die Etablierung eines Stakeholderforums mit dazugehörigen Arbeitsprozessen plädiert, und eine (vertikale) Integration verschiedener Ebenen durch einen möglichen Einbezug der Länderebene sowie eine klar definierte Zielsetzung für die Maßnahmenplanung empfohlen.

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List of abbreviations

AA	German Foreign Office
AG	Working Group
APA	Adaptation Action Plan
BLAG KliNA	Federal-state working group on climate, energy, mobility and sustainability
BMAS	Federal Ministry of Labour and Social Affairs
BMBF	Federal Ministry of Education and Research
BMEL	Federal Ministry of Food and Agriculture
BMI	Federal Ministry of the Interior and Community
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMVBS	Federal Ministry of Transport, Building and Urban Affairs
BMVI	Federal Ministry for Digital and Transport
BMWi	Federal Ministry for Economic Affairs and Energy
DAS	German Strategy for Adaptation to Climate Change
dena	German Energy Agency
DMIR	German Institute for Human Rights
DNSH-Prinzip	"Do no significant harm" principle
EEA	European Environment Agency
EEP	Institute for Energy Efficiency at the University of Stuttgart
HTS	High-Tech Strategy 2025
IMA	Interministerial Working Group
IMAA	Interministerial Working Group on Adaptation
KLiVO Portal	German Climate Protection Portal
KomPass	Climate Impacts and Adaptation Competence Centre
KWRA	Climate Impact and Risk Assessment 2021 for Germany
MIV	Motorised Individual Transport
MKA	Multi-Criteria Analysis
MKS	Mobility and Fuel Strategy
NAPE	National Energy Efficiency Action Plan
NAP-I	National Action Plan for Integration
NaRess	National Platform Resource Efficiency
NeRess	Resource Efficiency Network
NATO-Taxonomie	"Nodality Authority Treasure Organisation" Taxonomy
NWP	Network Partners
RENN	Regional Network Offices for Sustainability Strategies
SDGs	Sustainable Development Goals
SFA	Strategy Impact Assessment

AA	German Foreign Office
StA AFK	Standing Committee on Climate Change Adaptation
UBA	Federal Environment Agency, Dessau-Roßlau
UN	United Nations
VA	Vulnerability Analysis
ZKA	Climate Adaptation Centre

Zusammenfassung

Auch wenn es gelingen sollte, die Erderwärmung auf unter 2°C zu begrenzen, werden Treibhausgase, die sich bereits jetzt in der Atmosphäre befinden, das Klima in den nächsten Jahrzehnten beeinflussen. Tatsächlich wurden im Jahr 2020 zum ersten Mal ausschließlich Umweltrisiken auf den vorderen fünf Plätzen der wahrscheinlichsten Risiken der nächsten zehn Jahre aufgeführt, wobei das Scheitern des Klimaschutzes und der Anpassung an den Klimawandel als langfristiges Hauptrisiko genannt wurde (World Economic Forum 2020). Erste Auswirkungen des Klimawandels, beispielsweise Hitzewellen im Sommer und intensivere Unwetterereignisse mit Starkregen und Überschwemmungen, sind bereits heute spürbar und werden aller Voraussicht nach in Zukunft zunehmen. Diese klimatischen Veränderungen stellen Deutschland vor große Herausforderungen und machen Anpassungsmaßnahmen zu einer Notwendigkeit.

Mit der Deutschen Anpassungsstrategie an den Klimawandel (DAS) hat die Bundesregierung 2008 einen wichtigen Ansatzpunkt geschaffen, diesen Herausforderungen zu begegnen. Gemeinsam mit dem 2011 beschlossenen Aktionsplan Anpassung (APA) bildet sie einen wichtigen Grundstein für den langfristigen Prozess der Anpassung an den Klimawandel in Deutschland. Die DAS setzt mit der Formulierung von Zielen und Handlungsoptionen einen nationalen strategischen Rahmen, um die Verwundbarkeit von Wirtschaft, Umwelt und Gesellschaft gegenüber den Folgen des Klimawandels zu reduzieren. Inzwischen wurde diese Strategie mit drei Aktionsplänen unterlegt und hat sich kontinuierlich weiterentwickelt. So wurde mit dem dritten Aktionsplan Anpassung (APA III) die deutsche Anpassungspolitik von einer forschungsfokussierten in eine umsetzungsorientierte Phase überführt. Der 2019 veröffentlichte Evaluationsbericht zum Strategieprozess der DAS bewertet die Rahmenbedingungen des Strategieprozesses insgesamt als positiv, sieht allerdings einen Verbesserungsbedarf bei der Identifikation und Auswahl geeigneter Politikinstrumente, einer klaren Definition des Zielsystems sowie der Koordination zwischen beteiligten Akteuren und der Beteiligung weiterer Stakeholder (Gaus et al. 2019). Einen weiteren wichtigen Meilenstein der deutschen Anpassungspolitik stellt der 2020 veröffentlichte zweite Fortschrittsbericht zur DAS dar, der neben einer Festsetzung von politischen Schwerpunkten der nächsten Phase der Anpassungspolitik auch den aktualisierten Aktionsplan Anpassung (APA III) enthält. Die Kernelemente des Fortschrittsberichts bilden gemeinsam den Handlungsrahmen der Klimaanpassungspolitik in Deutschland für die nächsten Jahre.

Im Kontext des Strategieprozesses der DAS und der Identifikation und Auswahl konkreter Maßnahmen sind verschiedene Akteure relevant. Während die Erarbeitung der DAS noch im Rahmen einer informellen Arbeitsgruppe erfolgte, wurde der erste APA bereits durch die 2009 etablierte Interministerielle Arbeitsgruppe Anpassung (IMAA), die der ressortübergreifenden Abstimmung und Weiterentwicklung der DAS dient, entwickelt und 2011 per Kabinettsbeschluss verabschiedet (Die Bundesregierung 2011). Durch die Entscheidung, einen informellen Arbeitskreis der Ressorts durch die IMAA zu ersetzen, wurde das Thema Klimaanpassung formal auf der politischen Agenda der Bundesressorts verankert (Hustedt 2014). Begleitet wird der Strategieprozess der DAS durch wissenschaftliche Beratungsprozesse, unter anderem im Rahmen der Klimawirkungs- und Risikoanalyse 2021 (KWRA), deren Ziel es ist, anknüpfend an die Vulnerabilitätsanalyse (VA) 2015, ein aktualisiertes, handlungsfeldübergreifendes Gesamtbild der Vulnerabilität Deutschlands gegenüber dem Klimawandel zu erarbeiten. Neben der interministeriellen Zusammenarbeit und dem Dialog mit der Öffentlichkeit ist eine weitere zentrale Komponente die enge Zusammenarbeit mit den relevanten Bundesbehörden und -institutionen. Eine wichtige Institution im Kontext der Klimaanpassungspolitik in Deutschland ist das Behördennetzwerk Klimawandel und Anpassung.

Das von der IMAA mandatierte Netzwerk besteht derzeit aus 28 Bundesbehörden und -institutionen (Stand: Februar 2020). Es unterstützt die fachliche Zuarbeit und Abstimmung wissenschaftlicher Inhalte der zentralen Produkte der DAS und erarbeitete im Fortschreibungsprozess des Aktionsplans bereits einen Vorschlag geeigneter Politikinstrumente für den Aktionsplan Anpassung III (APA III) (Hetz et al. 2019).

Nicht zuletzt seit den zerstörerischen Überschwemmungen im Westen und Süden Deutschlands im Juli 2021 haben die Herausforderungen, denen die Klimaanpassungspolitik begegnen muss, im politischen und gesellschaftlichen Bewusstsein weiter an Bedeutung gewonnen. Umso wichtiger ist es, die bestehenden Prozesse und Institutionen der Klimaanpassungspolitik kritisch zu beleuchten und Optimierungspotentiale zu identifizieren.

Der vorliegende Endbericht ist Teil des vom UBA beauftragten Forschungsvorhabens „Behördennetzwerk Klimaanpassung: Methoden zur Unterstützung und inhaltliche Weiterentwicklung der deutschen Klimaanpassungsstrategie". Er stellt anhand verschiedener methodischer Analyseansätze dar, wo solche Optimierungspotentiale liegen und leitet daraus Empfehlungen für die Weiterentwicklung der DAS und damit zusammenhängender Prozesse ab. Ein besonderer Fokus der Erarbeitung von Empfehlungen lag dabei auf den Strukturen und Arbeiten des Behördennetzwerks Klimawandel und Anpassung. Im Rahmen der Fortschreibung der DAS und Erstellung des APA III wurde durch dieses Gremium ein Verfahren zur strukturierten Bewertung und Auswahl von Politikinstrumenten umgesetzt (siehe Hetz et al. 2019). Auf dieses Verfahren und dessen Optimierungspotenziale wird im vorliegenden Bericht mehrfach Bezug genommen und Hinweise für eine Weiterentwicklung und Verbesserung erarbeitet.

So bietet beispielsweise die Policy-Design-Forschung nützliche Hinweise durch die systematische Erarbeitung einer Typologie von Arten eines Policy Mix, welche bislang nicht umfassende Berücksichtigung in der Erarbeitung von Maßnahmenplänen in der Klimaanpassung fand. Durch die Berücksichtigung der Unterscheidung zwischen Instrumentenmix und Policy Mix kann ein verbessertes systematisches Verständnis der Ziele, Instrumente und Maßnahmen, die einen Policy Mix ausmachen, erreicht werden. Des Weiteren lassen sich aus der vergleichenden Analyse der DAS mit einer Anzahl von Politikstrategien auf Bundesebene zahlreiche Aspekte ableiten, die für einen Transfer auf das Politikfeld der Klimaanpassung geeignet erscheinen. Auch für die Weiterentwicklung des Behördennetzwerks Klimawandel und Anpassung lassen sich aus der vergleichenden Politikfeldanalyse Anknüpfungspunkte ausmachen.

Der Bericht zur Weiterentwicklung der Deutschen Anpassungsstrategie (DAS) und deren Policy Mix gliedert sich in drei Teile. Zunächst erfolgt eine Literaturanalyse verschiedener Stränge der Policy Design-Forschung. Nach der Beschreibung der methodischen Vorgehensweise bei der Literaturanalyse wird auf die wissenschaftlich-theoretischen Ansätze der Policy-Design-Forschung, der Governance-Forschung sowie der Transition- und Strategie-Forschung eingegangen, mit dem Ziel, mögliche Ansatzpunkte für den Transfer auf das Politikfeld der Klimaanpassung zu identifizieren. In den zusammenfassenden Schlussfolgerungen werden die Kernaspekte aus der Literaturanalyse im Hinblick auf die beschriebene Zielsetzung dargelegt.

Weiterer Bestandteil des Berichts ist eine **vergleichende Politikfeldanalyse** verschiedener Bundesstrategien, anhand derer Möglichkeiten zur Optimierung des Aktionsplanungsprozesses, der Akteursbeteiligung sowie der Steuerung des DAS-Prozesses identifiziert werden sollen. Hierfür erfolgt zunächst eine detaillierte Erläuterung der Methodik, woraufhin die Ergebnisse der Analyse, unterteilt in drei Schwerpunkte, dargelegt werden. Das Fazit des zweiten Teils fasst

die Ergebnisse der Analyse zusammen und stellt konkrete Empfehlungen zur Optimierung der Prozesse vor.

Basierend auf den Ergebnissen der vorherigen Analysen werden im letzten **Teil Empfehlungen für die Weiterentwicklung des Policy Mix zur DAS** formuliert. Hierbei wird konkret auf Bewertungs- und Auswahlprozesse von Anpassungsmaßnahmen eingegangen. Darauf folgen Ausführungen zum Vorgehen bei der Gestaltung eines Policy Mix sowie zum Thema der Akteurseinbindung und Integration von Beteiligungsprozessen. Im weiteren Verlauf wird aufgezeigt, wie die Integration verschiedener vertikaler Ebenen verbessert werden kann, bevor im letzten Abschnitt die Bedeutung eines neuen Visions- und Zieldefinitionsprozesses hervorgehoben wird.

Im Rahmen der „**Methodenanalyse Policy Design**" untersuchte das Vorhaben verschiedene wissenschaftlich-theoretische Ansätze der Erarbeitung und Bewertung eines Policy Mix, des Policy Design und verwandter Forschungsstränge. Ziel war es dabei, anhand einer Literaturanalyse Ansatzpunkte zu identifizieren, welche für einen Transfer auf das Politikfeld der Klimaanpassung geeignet erscheinen. Solche Ansatzpunkte können dabei beispielsweise methodischer, prozessorientierter und institutioneller Art sein. Unter dieser Zielstellung ergeben sich folgende Schlussfolgerungen:

1. Die *Policy-Design-Forschung* hat sich intensiv mit der Erarbeitung einer komplexen Policy-Mix-Typologie befasst. Diese Typologie erlaubt die Unterscheidung zwischen Analysen und Bewertungen von Einzelinstrumenten, Instrumentenkombinationen und Typen eines Policy Mix im engeren Sinne. Je nachdem, was evaluiert wird (ein Einzelinstrument, eine Kombination von Instrumenten in Hinblick auf ein Ziel oder mehrere Ziele, ein bestimmter Policy-Mix-Typus) ergeben sich systematische Konsequenzen für die Anwendung von Kriterien wie Effektivität, Flexibilität, Effizienz, Kohärenz und Synergiepotenzial bei der Erarbeitung von Vorschlägen zu Politikinstrumenten, nicht zuletzt im Behördennetzwerk Klimawandel und Anpassung.
2. Für die Analyse von prozessualen Ansatzpunkten in Netzwerken der Klimaanpassung und in Hinblick auf institutionelle Faktoren bietet sich die *Governance-Forschung* an, wobei ein enges Governance-Verständnis als netzwerkbasierte Koordinationsform einem breiten, tendenziell diffusen Verständnis vorzuziehen ist. Die Literaturanalyse unterstreicht die hohe Bedeutung der Unterscheidung von Netzwerktypen. Für das Behördennetzwerk wird vermutet, dass insbesondere die beiden Typen „Service delivery and implementation" (im Sinne eines Umsetzungsnetzwerks) einerseits und „Collaborative and network governance" (im Sinne eines Governance-Netzwerks) andererseits bedeutsam sind. Mit dieser Unterscheidung ergeben sich wichtige Ansatzpunkte für die Weiterentwicklung des Behördennetzwerks. Dies zeigt sich beispielsweise in der Gewichtung von Bewertungskriterien. So betonen Umsetzungsnetzwerke Kriterien wie Effektivität und Effizienz; Governance-Netzwerke hingegen betonen Kriterien wie Synergiepotenzial und Innovation. In der Realität sind allerdings auch Mischungen von Netzwerktypen zu erwarten, woraus sich wiederum Herausforderungen für das Management eines Netzwerks ergeben (z.B. Zuordnung von Kriterien, Inhalten und Aktivitäten im Netzwerkmanagement).
3. Klimaanpassungspolitik hat sozusagen „naturgemäß" auch eine starke langfristige Komponente. *Transition- und Strategie-Forschungen* differenzieren in höherem Maße als die Policy-Design- und Governance-Forschung zwischen unterschiedlichen Zeithorizonten von Konzepten und schenken langfristigen visionsgetriebenen Veränderungsprozessen erhöhte Aufmerksamkeit. In die Literaturanalyse wurden deshalb auch aktuelle Review-Aufsätze zur Transition- und Strategie-Forschung einbezogen. Dabei zeigte sich, dass die Transition-Forschung vor allem das Verständnis für disruptiven Regimewandel und das sich Öffnen von

Gelegenheitsfenstern fördert. Vorbereitung auf solche Gelegenheitsfenster erfordert tendenziell adaptive Strategieprozesse im Sinne der Strategieforschung.

Die **Policy-Design-Forschung** überzeugt vor allem durch die systematische Erarbeitung einer komplexen Typologie von Arten eines Policy Mix. Bisherige UBA-Projekte zur DAS-Aktionsplanung haben diese Typologie entweder gänzlich außer Acht gelassen (so z.B. Blobel et al. 2016) oder erst ansatzweise berücksichtigt (so z.B. Hetz et al. 2019). Blobel et al. (2016) fokussieren in der Publikation zum „Vorschlag für einen Policy Mix für den Aktionsplan Anpassung an den Klimawandel" auf die Kombination von Steuerungsinstrumenten und Maßnahmen der Klimaanpassung. Dass der *Ausdruck „Policy Mix" gemäß Policy-Design-Forschung eigentlich die Kombination von mindestens zwei „Policies" erfordert*, fand keine Beachtung. Hetz et al. (2019) gehen schon intensiver auf die vielfältigen Möglichkeiten des Designs eines Policy Mix ein, verwenden allerdings nicht systematisch die Unterscheidung zwischen Instrumentenmix und Policy Mix.

Das Behördennetzwerk Klimawandel und Anpassung hat sich zunehmend mit Fragen der Erarbeitung eines Policy Mix zur Klimaanpassung befasst. Die Policy-Mix-Typologie der Policy-Design-Forschung wurde dabei allerdings nicht umfassend und systematisch in Ansatz gebracht (vgl. Hetz et al. 2019). Zusammenfassend und etwas vereinfachend ist es möglich zu formulieren, dass Fragen der Kombination von „Policies" bisher vor allem als Fragen der Kombination von Politik*instrumenten* behandelt wurden. Das Behördennetzwerk hat sich also mit Instrumentenkombinationen, weniger mit der systematischen Verknüpfung von „Policies" befasst. Interdependenzen zwischen den Zielen und Instrumenten von unterschiedlichen „Policies" fanden ihren Niederschlag in der Auswahl von Kriterien zur Analyse und Bewertung von Instrumenten (die Kriterien der Effektivität, Flexibilität, Effizienz, Kohärenz, Synergiepotenzial, vgl. Hetz et al. 2019). Die Anwendung der Kriterien auf ausgewählte Handlungsfelder der Klimaanpassung führte insbesondere zu Aussagen zu Einzelinstrumenten und nur ergänzend und ansatzweise zur Berücksichtigung von Instrumentenkombinationen in den Handlungsfeldern.

Vor diesem Hintergrund liegt es nahe, Potenziale zum Transfer der Policy-Design-Forschung vor allem in der systematischen Anwendung der Policy-Mix-Typologie auf die Ausgestaltung des Verfahrens zur Analyse und Bewertung von Politikinstrumenten zu vermuten. Ein solcher Transfer würde sich vor allem in der innovativen Weiterentwicklung des Verfahrens in Form einer veränderten Verwendung von Kriterien für die Bewertung von Politikinstrumenten niederschlagen:

- *Analyse und Bewertung von Einzelinstrumenten:* Das bisherige Verfahren zur Unterstützung der DAS-Aktionsplanung hat sich vor allem in Hinblick auf Einzelinstrumente bewährt. Durch die Entwicklung und Erprobung des Verfahrens konnten zahlreiche Erfahrungswerte zur konkreten Durchführung des Verfahrens und Hinweise zur Verfahrensverbesserung gesammelt werden (vgl. zusammenfassend Hetz et al. 2019). Solche Verbesserungen betreffen beispielsweise die Verständigung zwischen den NWP über die Aufgaben und Rollen der einzelnen Partner und des Netzwerks insgesamt, das Verständnis und die konkrete Anwendung der fünf Kriterien zu Politikinstrumenten und zahlreiche Details zur eher „technischen" Durchführung des Verfahrens.

- *Analyse und Bewertung von Instrumentenkombinationen:* Fragen eines Instrumentenmix in den Handlungsfeldern der Klimaanpassung standen beim bisher praktizierten Verfahren allerdings nicht im Mittelpunkt. Im Zuge der Analyse und Bewertung von Einzelinstrumenten wurden (1) Hinweise zu übergreifenden Politikinstrumenten gesammelt (z.B. Klima-Basisdienste) und (2) *nach* der Bewertung von Einzelinstrumenten lediglich

ergänzende Bewertungsurteile zur Kombination von instrumentellen Aussagen erarbeitet. Die Verwendung der Policy-Design-Forschung für die Weiterentwicklung des Verfahrens würde bereits bei der intensiveren und in höherem Maße systematischen Analyse und Bewertung von Kombinationen von Instrumenten zu signifikanten Verfahrensänderungen führen. Dies würde beispielsweise die Art der Zielformulierung für die Anwendung des Kriteriums der Effektivität betreffen als auch die Bewertung von Interdependenzen zwischen mehreren Instrumenten. So werden Bewertungen von Instrumentenkombinationen unter dem Kriterium der Effektivität durch eine möglichst konkrete und eindeutige Zielformulierung erleichtert. Dies legt es nahe, Kombinationen von Instrumenten effektivitätsorientiert *möglichst unter nur einer Zielvorgabe* und nicht mit mehreren Zielen zu bewerten. Das Set an Bewertungskriterien müsste zudem in Hinblick auf mehrere Instrumente durch das Kriterium der Konsistenz erweitert werden. *Im Rahmen des Verfahrens wäre deutlich zwischen der Kohärenz von Zielen und der Konsistenz von Instrumenten zu unterscheiden.* Insgesamt zeigt sich, dass die systematische Berücksichtigung der Policy-Design-Forschung bereits in Hinblick auf Instrumentenkombinationen zu signifikanten, wenn auch nicht grundsätzlichen Änderungen des Verfahrens im Rahmen des Behördennetzwerks führen dürfte.

- *Analyse und Bewertung von Typen eines Policy Mix:* Von den Policy-Mix-Typen sind vermutlich zwei für die DAS von besonderer Bedeutung: der „klassische Policy Mix" (Typ IV: Mehrere Politiken, Ziele und *eine* Ebene der Strategieentwicklung) sowie der „Ebenen-übergreifende komplexe Policy Mix" (Typ VIII: Mehrere Ebenen, Ziele und „Policies"). Die Policy-Design-Forschung argumentiert allerdings, dass die komplexe Strategie für mehrere Policies und Ebenen besonders hohen Herausforderungen der effektiven Realisierung gegenübersteht. Insbesondere für ressortübergreifende und auf mehrere räumlich-institutionelle Ebenen bezogene Strategien stellt sich damit die Frage, wie *ambitioniert* der Anspruch der Querschnittsorientierung gewählt wird (vgl. Vetter et al. 2017). Im Vergleich zur Analyse und Bewertung von Instrumentenkombinationen ist die Weiterentwicklung des Verfahrens zu Politikinstrumenten im Behördennetzwerk als Policy Mix noch deutlich ambitionierter. Hierfür gibt es zahlreiche Gründe, von denen im Folgenden einer in den Vordergrund gerückt werden soll: Beiträge des Behördennetzwerks zur Realisierung eines Policy Mix erfordern bereits im Falle des Typ IV die Erarbeitung eines kohärenten Zielsystems über mindestens zwei „Policies" hinweg. Fragen der Konsistenz von Instrumenten können erst nach der Analyse eines komplexen Sets an mehr oder weniger konkreten Zielaussagen (vgl. Hetz et al. 2019) systematisch behandelt werden. Beiträge des Behördennetzwerks zu Instrumentenkombinationen als Bestandteile eines Policy Mix setzen damit die stärkere Differenzierung der Analyse zwischen Politiken, Zielen und Politikinstrumenten voraus. Das bisherige Verfahren müsste für eine solche Bewertungsaufgabe in hohem Maße, wenn auch nicht grundsätzlich überarbeitet werden.

Die DAS ist ein horizontal und vertikal komplexer Strategieprozess. Horizontal ergibt sich diese Komplexität durch die hohe Anzahl und Vielfalt an Handlungsfeldern der Klimaanpassung wie sie im Überblick im zentralen Strategiedokument aus dem Jahr 2008 dargestellt wird (Die Bundesregierung 2008). Vertikal ergibt sich diese hohe Komplexität aus den unterschiedlichen räumlich-institutionellen Ebenen der DAS und den Akteuren, die auf diesen Ebenen zentrale Rollen spielen. Eine hohe Komplexität ergibt sich auch daraus, dass die historischen und sachlich-räumlichen Bedingungen der Klimaanpassung je nach Handlungsfeld und konkreter politisch-administrativer Problemstellung unterschiedliche Ausprägungen annehmen können und vielfältig interagieren. So gibt es beispielsweise zu Strategien für Flusshochwasser bereits zahlreiche Erfahrungswerte auf der kommunalen Ebene sowie den Ebenen der Bundes- und

Landespolitik – nicht zuletzt als Reaktionen auf das Flusshochwasser der Elbe und ihrer Nebenflüsse im August des Jahres 2002. Im Vergleich dazu hat der Hitzesommer im Jahr 2003 weniger Reformaktivitäten ausgelöst. Die Vorsorge für Hitzebelastungen in urbanen Gebieten und den Umgang mit Hitzewellen gewinnt allerdings in den letzten Jahren auf der Grundlage von Erfahrungswerten mit wiederkehrenden Hitzesommern an Bedeutung. Die Katastrophe im Ahrtal in Folge eines Starkregenereignisses im Jahr 2021 hat die Notwendigkeit einer verstärkten Strategieentwicklung für die Reduzierung von Starkregenrisiken eindringlich vor Augen geführt. Für die Reduzierung von Fluss- und Starkregenrisiken ist die Beachtung von sachlich-räumlichen Unterschieden zwischen diesen beiden Arten von Umweltrisiken von hoher Bedeutung (z.B. typische Flusshochwasserrisiken als mittel- bis langfristig vorausschauend sachlich-räumlich stärker eingrenzbare Risiken im Vergleich zu Starkregenrisiken, die im Prinzip ubiquitär auftreten können).

Die Policy-Design-Forschung hat ein Verständnis von Policy Mix entwickelt, das genau dieser hohen Komplexität entspricht. Für die DAS insgesamt soll hier deshalb vermutet werden, dass die Policy-Design-Forschung Grundlagen für ein proportionales Policy Design in der Praxis der Klimaanpassungspolitik zur Verfügung stellt. Wie diese Grundlagen genutzt werden, hängt insbesondere von den konkreten Zielen für die Weiterentwicklung der DAS ab. Auch hier bietet es sich an, Transferpotenziale der Policy-Design-Forschung nach Einzelinstrument einerseits sowie Instrumentenmix und Policy Mix andererseits zu differenzieren.

Insgesamt ergibt sich, dass die Konzepte der Policy-Design-Forschung *im Verbund* in die Weiterentwicklung der DAS einbezogen werden sollten. Erst die Orientierung an Einzelinstrumenten, Instrumentenkombinationen und Optionen für einen Policy Mix erlaubt die für effektive Klimaanpassungspolitik erforderliche Flexibilität in der Politikgestaltung.

Die **Governance-Forschung** erhellt prozessuale Ansatzpunkte in der Weiterentwicklung der DAS, des Behördennetzwerks Klimawandel und Anpassung im Besonderen (z.B. Strategien des Netzwerkmanagements, Collaborative-Governance-Episoden). Es gibt allerdings auch institutionenorientierte Ansatzpunkte, denn die Unterscheidung zwischen einem Netzwerk als Umsetzungsnetzwerk oder Governance-Netzwerk (im Sinne des Netzwerktypus „Collaborative and network governance", Klijn und Koppenjan 2016) ist für die kollektive Identität des Behördennetzwerks von Bedeutung und eine solche Identität weist zahlreiche Bezüge zu institutionellen Regelungen der DAS auf (z.B. Mandatierung des Behördennetzwerks). Auch bei Multi-Level-Governance und Metagovernance sind institutionelle Ansatzpunkte zu beachten.

Governance als netzwerkbasierte Koordination geht über einzelne Netzwerke (wie dem Behördennetzwerk) hinaus und thematisiert weit gespannte Beziehungen von Akteuren auf den räumlich-institutionellen Ebenen der DAS. Die Policy-Mix-Typologie der Policy-Design-Forschung thematisiert gleichfalls, wie erwähnt, Optionen für vertikale Ebenen (z.B. Typ VI als sektoraler Policy Mix und Typ VIII als Maximalprogrammem der Policy Integration).

Für den Transfer der Multi-Level-Governance-Forschung bietet sich u.a. das Policy-Feedback-Modell von Tosun und Treib (2018) an. Policy-Feedback-Prozesse für „Policies" mit einer ausgeprägten Zweckrationalität erfordern, so Tosun und Treib (2018), eine gewisse Begrenzung dezentraler Spielräume von Akteuren auf der Ebene der Implementation. Begrenzungen können in den Politikinhalten sowie der Anzahl und den institutionellen Eigenschaften von Akteuren liegen, um nur drei Beispiele für Arten von Einschränkungen der Implementation zu nennen. Policy-Feedback-Prozesse, die stärker auf die Erkundung („Exploration") neuer instrumenteller Möglichkeiten, auf die Anpassung an dezentral unterschiedliche Rahmenbedingungen und die Gewährung von Freiheitsgraden bei den Akteuren der Umsetzung Wert legen, würden dezentralisierte Implementationsstrukturen erfordern. Auch bei Fragen der Umsetzung von

Politikzielen und -instrumenten in den DAS-Handlungsfeldern wäre also zu unterscheiden, ob Kriterien wie Effektivität im Vordergrund stehen (dann vermutlich zentrale Implementation, wenn dies mit Effizienzargumenten vereinbar ist, z.B. in Hinblick auf den Einsatz ökonomischer Instrumente) oder ob dezentrale Experimente und inhaltliche Vielfalt einen „Nährboden" für künftige Innovationen bieten sollen (dann dezentralisierte Implementation). Über einen Mix von Netzwerktypen hinaus ginge es also bei der Weiterentwicklung der DAS auch um die Gestaltung der Kombination unterschiedlicher Implementationsstrukturen.

Die Policy-Design- und Governance-Forschung einerseits und die **Transition- und Strategie-Forschung** andererseits unterscheiden sich durch ihre Blickrichtung. Policy- und Governance-Forscher/innen blicken von Politik und Verwaltung ausgehend auf gesellschaftliche Rahmenbedingungen und ihre Veränderung. Transition- und Strategie-Forscher/innen blicken von gesellschaftlichen Wandelprozessen ausgehend auf die darin enthaltenen lang-, mittel- und kurzfristigen Ziele, Instrumente und Maßnahmen in Zivilgesellschaft, Wirtschaft, Politik und Verwaltung usw. Die Transition-Forschung unterscheidet systematischer als die Policy-Design- und Governance-Forschung zwischen kurz-, mittel- und langfristigen Konzepten (vgl. Loorbach et al. 2017, Köhler et al. 2019). Zwischen der Policy-Design- und Governance-Forschung sowie der Transition- und Strategie-Forschung bestehen allerdings auch zahlreiche Schnittmengen (vgl. Köhler et al. 2019). Für Loorbach et al. (2017) gehört Governance zum „Herz" der Transition-Forschung.

Arbeiten zur DAS verwenden bereits die Unterscheidung zwischen inkrementellen und radikalen Wandelprozessen (vgl. z.B. Mahrenholz et al. 2017). Diese Unterscheidung bietet einen Ansatzpunkt für die vertiefende Analyse und Interpretation der Transferpotenziale der Transition- und Strategie-Forschung. Für die DAS wäre von Interesse, welche Verlaufsformen des zu beobachtenden und zu erwartenden Wandels in den DAS-Handlungsfeldern festzustellen sind. Zudem wäre interessant, ob sich Disruptionen und die Reaktionen auf und Strategien für Unterbrechungen nach Handlungsfeldern systematisch unterscheiden. Der Transfer der Transition- und Strategie-Forschung speziell auf die DAS würde sich in neuen empirischen Befunden zur Beschreibung und Erklärung von Wandelprozessen niederschlagen (vgl. Turnheim et al. 2018). Mehr Wissen zu bereits ablaufenden und möglichen künftigen disruptiven Wandelprozessen in den DAS-Handlungsfeldern wäre eine wichtige Grundlage, um die Klimaanpassungspolitik auf die mittel- und langfristige Nutzung von Gelegenheitsfenstern für die Realisierung *ihrer* Ziele vorzubereiten.

Das Transferpotenzial der Transition- und Strategie-Forschung für das Behördennetzwerk Klimawandel und Anpassung hängt in hohem Maße davon ab, wie mit dem Netzwerk als Umsetzungs- und Governance-Netzwerk umgegangen wird:

- Wenn das Behördennetzwerk vorrangig ein *Umsetzungsnetzwerk* darstellt und eher traditionell vor allem anhand der Kriterien Effektivität, Flexibilität und Effizienz zu steuern ist, liegt es *nicht* nahe zu vermuten, dass es viele Ansatzpunkte für den Transfer der Transition- und Strategieforschung gibt. Die Weiterentwicklung des Netzwerks wäre mittels des Transfers der Policy-Design- und Governance-Forschung hinreichend möglich.
- Wenn das Behördennetzwerk allerdings in höherem Maße als bisher Kriterien wie Kohärenz und Synergiepotenzial berücksichtigen und zudem ein höheres Ambitionsniveau in Hinblick auf seinen Beitrag zu radikalen Wandelprozessen im Sinne der langfristigen Klimaanpassung verfolgen würde, ergäben sich vermutlich mehr Transferpotenziale für Transition- und Strategieforschung.

Damit wird hier für grundlegende Orientierungen zur Ausrichtung des Behördennetzwerks Klimawandel und Anpassung auf der Basis der Policy-Design- und Governance-Forschung *vor* einer umfangreichen Analyse und Bewertung der Transferpotenziale der Transition- und Strategie-Forschung auf das Netzwerk argumentiert. Entscheidend ist letztlich erneut (wie oben bereits erwähnt) die Gewichtung von Bewertungskriterien für die Weiterentwicklung des Netzwerks im Rahmen der DAS – nicht nur in Hinblick auf die Erarbeitung von Vorschlägen zu Politikinstrumenten, sondern auch für die Entwicklung des Netzwerks insgesamt.

Das Ziel der **vergleichenden Politikfeldanalyse,** welche in Kapitel 3 beschrieben wird, bestand darin, durch eine vergleichende Betrachtung der DAS mit weiteren Bundesstrategien, Ansatzpunkte für eine Optimierung des Aktionsplanungsprozesses, der Akteursbeteiligung sowie Steuerung des DAS-Prozesses zu identifizieren. Zu Beginn der Analyse wurden weitere ressort- und ebenenübergreifende Bundesstrategien ausgewählt und im weiteren Vorgehen der DAS vergleichend gegenübergestellt. Anhand einer Literatur- und Dokumentenanalyse sowie der Durchführung von Interviews mit Expertinnen und Experten wurden daraufhin Hinweise für eine Optimierung des DAS- und APA-Prozesses herausgearbeitet. Von besonderer Bedeutung waren Fragestellungen der Akteurskooperation, Koordinierung und Dialogprozesse, die zu einer Auswahl von Maßnahmen zur Umsetzung der Strategie geführt haben. Die Frage, wie innerhalb dieses Prozesses die divergierenden Akteursinteressen balanciert werden, oder die Frage, welche methodische und institutionelle Verankerung das Verfahren kennzeichnen, waren von spezifischer analytischer Relevanz. Ebenfalls von analytischem Interesse waren Hinweise dazu, welche Auswahlkriterien für die Priorisierung von Maßnahmen angewandt wurden. Die Ergebnisse dienten dem Ziel, die strategische Entwicklung und Umsetzung der DAS zu optimieren.

Neben den für die Breite an Strategieprozessen geltenden Erfolgsfaktoren (z.B. Zusammenarbeit und Abstimmung zwischen beteiligten Ressorts, erfolgreicher Ablauf eines Aktionsplanungsprozesses, Arbeit von Netzwerken und Gremien) können aus der vergleichenden Politikfeldanalyse diverse Hinweise spezifisch für die Weiterentwicklung und Optimierung des DAS-Prozesses abgeleitet werden. Aus Gründen der Übersichtlichkeit werden diese in prozessuale, methodische und institutionelle Aspekte unterteilt.

Der **Prozess der Aktionsplanung** beinhaltet die Auswahl sowie gegebenenfalls Bewertung und Priorisierung von Maßnahmen. Hier verspricht ein integratives Verfahren zur gemeinsamen Erarbeitung von Maßnahmen, Maßnahmenbündeln oder Kernvorhaben durch Ressorts und Stakeholder Möglichkeiten für eine prozessuale Weiterentwicklung. Um bei einem solch umfassenden Verfahren zur Stakeholdereinbindung einen funktionierenden Arbeitsablauf sicherzustellen, eignet sich eine Unterteilung in thematische Arbeitsgruppen.

Die Entscheidung, welche Stakeholder in den Prozess eingebunden werden, sollte auf einer anfänglichen strukturierten Abfrage aller relevanten Akteure basieren, um Rückmeldung einzuholen, wer Interesse an einer solchen Einbindung hat. Für diese Abfrage könnten die Verteiler der entsprechenden Fachgebiete des BMU und UBA sowie eine Online-Bekanntmachung genutzt werden.

Jenseits des Behördennetzwerks Klimawandel und Anpassung erfolgt bislang in erster Linie eine punktuelle und nicht institutionalisierte Einbindung von Stakeholdern. Dies kann bei einer Weiterentwicklung des Prozesses geändert und ein verstetigter, strukturierter Beteiligungsprozess, wie er in zahlreichen anderen Strategien angelegt ist, etabliert werden. Ein derart umfassender Stakeholderdialog beinhaltet langfristig angelegte Gremien mit regelmäßigen Treffen, definiertem Arbeitsoutput und Aufgabenstellung, die Koordination durch eine eigene Geschäftsstelle und einen regelmäßigen Austausch mit den Ressorts. Ein solcher

umfassender Stakeholderdialog umfasst verschiedene Arbeitsgruppen und nach Arbeitsauftrag und Prozessphase passende Formate, die flexibel angepasst werden können. Auf diese Weise kann eine wichtige Grundlage für den Weiterentwicklungsprozess des DAS und den Maßnahmenauswahlprozess im Rahmen des APA geschaffen werden.

Der APA sollte neben eindeutigen Zielvereinbarungen auch klare Verantwortlichkeiten für die Umsetzung von Maßnahmen benennen sowie Zeit- und Arbeitspläne enthalten. Für den gesamten Prozessverlauf sollte sichergestellt werden, dass klar kommuniziert wird, wie der jeweilige Input von den Ressorts oder der IMAA weiterverwendet wird.

Die öffentliche Aufmerksamkeit für das Politikfeld der Anpassung an den Klimawandel ist in den vergangenen Jahren stark gestiegen. Um diesem gestiegenen Interesse Rechnung zu tragen und den damit einhergehenden Informationsbedarf zu adressieren, kann ein zentraler Internetauftritt für die DAS und die damit verbundenen Prozesse und Portale eingerichtet werden.

Methodisch lassen sich in erster Linie Hinweise für eine Optimierung eines Bewertungs- und Priorisierungsverfahrens von Anpassungsmaßnahmen ableiten. Für ein Bewertungsverfahren von Maßnahmenvorschlägen geben die Analyseergebnisse Hinweise bezüglich geeigneter Bewertungskriterien, die in einem solchen Verfahren zur Anwendung kommen können. Bislang wurden bei diesem Verfahren die administrative und politische Umsetzbarkeit von Maßnahmen, einschließlich der Umsetzungskosten, sowie gesamtwirtschaftliche Auswirkungen wie etwa verteilungs- und regionalpolitische Effekte nicht betrachtet. Bei einem neuen Verfahren kann mindestens ein Teil dieser Faktoren berücksichtigt und in die Bewertung einbezogen werden. Eine hilfreiche Ergänzung der Bewertungskriterien stellt zudem die Bereitstellung von Leitfragen dar, die für die Teilnehmenden eine Hilfestellung bei der Einordnung von Kriterien geben.

Für eine Priorisierung von Maßnahmenvorschlägen, die im Rahmen einer Empfehlung durch das Behördennetzwerk oder etwaige weitere Gremien ausgesprochen werden, bestehen verschiedene Möglichkeiten, falls eine solche Weiterentwicklung gewollt ist. Denkbar ist, eine Anzahl prioritär umzusetzender Maßnahmen auf Basis der abgegebenen Bewertungen festzulegen. Eine vorher definierte Zahl von Maßnahmen, die die höchste Bewertung erhalten haben, werden entsprechend als Priorität weitergegeben. Alternativ kann eine Vergabe von Punkten erfolgen, bei der die Beteiligten eine bestimmte Anzahl an Maßnahmen als prioritär durch Punktevergabe ausweisen können. Die Maßnahmen, die von den meisten Beteiligten einen Punkt erhalten haben, werden anschließend als Prioritäten aufgelistet. Beide dieser Vorschläge können ohne signifikanten Mehraufwand im Rahmen des Auswahl- und Bewertungsprozesses des Behördennetzwerks umgesetzt werden. Wichtig wäre in diesem Fall, dass die resultierenden prioritären Maßnahmen auch im APA als solche aufgeführt und so aus der Fülle der gelisteten Maßnahmen hervorgehoben werden.

Eine alternative Weiterentwicklung des APA könnte zudem durch die Erarbeitung von klar definierten Kernvorhaben erreicht werden. Eine limitierte Anzahl solcher detailliert ausgearbeiteten Kernvorhaben ermöglicht eine Fokussierung von Aktivitäten und erhöht zugleich die Sichtbarkeit und Zugänglichkeit der Maßnahmen.

Für die Einbindung von Stakeholdern in den DAS- und APA-Prozess eignet sich eine verstetigte und **institutionalisierte Erweiterung** des bisherigen Beteiligungsprozesses. Eine Möglichkeit für eine solche Erweiterung ist eine Verbreiterung des Behördennetzwerks durch Ergänzung von Vertreter/innen der Kommunen, Länder, Zivilgesellschaft und Wirtschaft. Dies kann jedoch leicht zu einer Überladung der Struktur und der Arbeitsweise des Netzwerks führen. Eine bessere Option stellt daher ein das Netzwerk ergänzendes Stakeholdergremium dar. Während

das Behördennetzwerk ähnlich einem Expert/innenrat aufgesetzt ist (wenn auch mit einer höheren Anzahl an Mitgliedern), kann ein Stakeholderforum die verstetigte Einbindung einer größeren Bandbreite an betroffenen Akteuren gewährleisten.

Für das Behördennetzwerk selbst sollte eine klare Zielsetzung und Funktionsbeschreibung erarbeitet und gegebenenfalls in Form einer Geschäftsordnung festgehalten werden.

Für die Zusammenstellung eines Stakeholderforums sollte eine systematische und transparente Auswahl von Beteiligten erfolgen. Basierend auf einer allgemeinen Abfrage, welche Akteure sich in einen solchen Prozess einbringen möchten, kann eine Auswahl dahingehend erfolgen, dass sichergestellt wird, dass alle relevanten Akteursgruppen vertreten und auch mit wenigen Ressourcen ausgestattete Positionen/Stakeholdergruppen integriert sind. Um zu einer handhabbaren Größe zu gelangen, sollten die beteiligten Stakeholder in inhaltliche Arbeitsgruppen unterteilt werden. In diesen Arbeitsgruppen ist eine Überschneidung mit dem Behördennetzwerk denkbar und sinnvoll. Themenspezifische Zusammenarbeit in Arbeitsgruppen hat das Potential, Abstimmungsprozesse zu vereinfachen und Fachwissen zu bündeln. Die in Arbeitsgruppen generierten Outputs sollten wiederum im Plenum diskutiert werden, um einen kohärenten Gesamtprozess herzustellen.

Zusätzlich sollte auch die punktuelle Beteiligung durch Veranstaltungen beibehalten werden. Im Verlauf der Analyse wurde mehrfach die Bedeutung einer Plattform zum Austausch und zur Vernetzung von Akteuren hervorgehoben.

Eine grundlegendere Neuausrichtung der DAS und des APA selbst ist basierend auf den Analyseergebnissen ebenfalls empfehlenswert, um zu einem höheren Ambitionsniveau der deutschen Klimaanpassungspolitik zu gelangen. Die bereits spürbaren Auswirkungen des Klimawandels bedeuten einen verstärkten Bedarf an der Umsetzung wirkungsvoller Anpassungsmaßnahmen. Der Übergang der DAS in eine solche umsetzungsorientierte Phase verlangt ein verstärktes politisches Backing und eine entsprechende institutionelle Aufhängung. Eine strategische Neuausrichtung der DAS entlang von Leitgedanken oder Kernzielen, die in Zusammenarbeit von IMAA und weiteren Stakeholdern erarbeitet wurden, wird daher empfohlen. Dies würde eine Bündelung von Aktivitäten und Akteuren sowie der Verknüpfung unterschiedlicher Ebenen, spezifisch der Ebenen der Länder, Kommunen und Zivilgesellschaft erlauben. Mit Hilfe einer klaren Zieldefinition würde die gemeinsame Verfolgung dieser Ziele durch beteiligte Stakeholder gefördert, ebenso wie die Entfaltung verstärkter Umsetzungs- und Kooperationsdynamiken. Die Fokussierung von Aktivitäten entlang von Missionen oder Kernvorhaben würde zudem die Sichtbarkeit und Außenwirkung der deutschen Klimaanpassungspolitik erhöhen. Somit könnte eine der häufigsten Herausforderungen, die in den untersuchten Strategieprozessen deutlich wurde, adressiert werden: Die Gewährleistung einer wirksamen Abstimmung der vielen Einzelmaßnahmen untereinander und zielgenaue Ausrichtung zahlreicher Aktivitäten. Auch könnten so Zielkonflikte früher adressiert und Synergien genutzt werden. Solche übergreifenden Leitgedanken sollten gemeinsam erarbeitet werden anhand von Input durch das Behördennetzwerk, fachlichen Expertinnen und Experten und weiteren Stakeholdern.

Die **Empfehlungen des vorliegenden Berichts zur Weiterentwicklung der DAS** zielen auf verschiedene Aspekte der Anpassungspolitik ab. Hierzu gehören die Bewertungs- und Auswahlprozesse von Anpassungsmaßnahmen für den APA, die Prozesse zur Einbindung und Beteiligung von Akteuren bei der Erarbeitung eines Policy Mix sowie die Verbesserung der Integration verschiedener vertikaler Ebenen.

Für den **Auswahlprozess von Anpassungsmaßnahmen** hebt der Bericht die Vorteile eines integrativen Ansatzes hervor und plädiert dafür, den Umfang der Akteursbeteiligung zu

erweitern. Durch die Einbindung einer größeren Bandbreite von Akteuren wird sowohl die Qualität der Anpassungsplanung erhöht als auch eine breitere Akzeptanz für die Maßnahmen gefördert. Auch über den Auswahlprozess hinaus empfiehlt der Bericht Beteiligungsprozesse zur Einbindung von Akteuren in den gesamten Aktionsplanungsprozess und weitere DAS-Prozesse zu verstetigen. Die Etablierung eines Stakeholderforums mit dazugehörigen Arbeitsprozessen stellt einen Weg dar, diese Einbindung von und Koordination mit relevanten Akteuren zu institutionalisieren und zu verstetigen. Die hier beschriebene verstetigte Einbindung von Stakeholdern in Kombination mit ergänzenden Dialogprozessen stellt eine sinnvolle Weiterentwicklung des DAS-Prozesses dar und kann die Legitimation, Akzeptanz und Sichtbarkeit desselben erhöhen.

Für die **Auswahl neuer Politikinstrumente und Maßnahmen** im Rahmen eines optimierten Policy Mix in der Klimaanpassung bedarf es zudem einer detaillierten Betrachtung der bereits bestehenden Maßnahmen. Andernfalls kann es zu einem sogenannten „layering" kommen, bei dem neue Instrumente und Instrumentenkombinationen zu bereits bestehenden Politikinstrumenten hinzugefügt werden, ohne dass eine übergreifende Betrachtung möglicher Wechselwirkungen und der langfristigen Konsistenz zwischen diesen Instrumenten umgesetzt wird (Ekvall et al. 2016). Um dies zu vermeiden, können die Ergebnisse der KWRA herangezogen werden, da die dort abgeleiteten dringenden und sehr dringenden Handlungserfordernisse die Lücken bestehender Anpassungsplanung verdeutlichen, auf die bei der Auswahl neuer Instrumente der Fokus gelegt werden sollte. Weiterhin wird eine Auswahl von priorisierten Kernvorhaben empfohlen, um bestimmte Maßnahmen fokussiert behandeln zu können sowie die Sichtbarkeit und Zugänglichkeit der Anpassungspolitik zu erhöhen.

Ein weiterer Verbesserungsvorschlag betrifft die **(vertikale) Integration verschiedener Ebenen**. Um schwer zu beantwortende Grundsatzfragen der vertikalen Politikintegration zu vermeiden, bietet sich die Identifikation von geeigneten Beispielthemen an, anhand derer ein mögliches koordinatives Vorgehen aufgezeigt werden kann. Zudem kann die Ebene der Bundesländer in die Arbeiten des Behördennetzwerkes einbezogen werden, um eine optimierte Abstimmung des APAs mit den auf Länderebene stattfindenden Anpassungsaktivitäten zu erreichen. In diesem Zusammenhang wäre auch eine stärkere Verknüpfung zwischen den Bedarfen der Kommunen und der Aktionsplanung auf Bundesebene zu befürworten.

Als finaler Aspekt innerhalb dieser Empfehlungen zur Weiterentwicklung der DAS wird eine **klar definierte Zielsetzung** als entscheidender Erfolgsfaktor für die Maßnahmenplanung hervorgehoben. Hierdurch werden die Abstimmung und Koordination zwischen den politischen Ebenen sowie den beteiligten Akteuren erleichtert. Gerade für den Anstoß tiefgreifender transformativer Prozesse in der Klimaanpassung sind greifbare Leitziele essentiell.

Summary

Even if we succeed in limiting global warming to below 2°C, greenhouse gases in the atmosphere will affect the climate in the coming decades. In fact, in 2020, for the first time, only environmental risks were listed in the top five most likely risks over the next ten years, with failure to mitigate and adapt to climate change cited as the main long-term risk (World Economic Forum 2020). The first effects of climate change, for example heat waves in summer and more intense severe weather events with heavy rainfall and flooding, are already being felt and will most likely increase in the future. These climatic changes pose major challenges for Germany and make adaptation measures a necessity.

With the German Strategy for Adaptation to Climate Change (DAS), adopted in 2008, the Federal Government created an important starting point for meeting these challenges. Together with the Adaptation Action Plan (APA) adopted in 2011, it forms a cornerstone of the long-term process of adaptation to climate change in Germany. By formulating goals and options for action, the DAS sets a national strategic framework to reduce the vulnerability of the economy, environment and society to the impacts of climate change. In the meantime, this strategy has been underpinned by three action plans and has continuously evolved. For example, with the third Adaptation Action Plan (APA III), German adaptation policy moved from a research-focused to an implementation-oriented phase. The evaluation report on the DAS strategy process, published in 2019, assesses the framework conditions of the strategy process as positive overall, but recognises a need for improvement in the identification and selection of suitable policy instruments, the clear definition of the target system, as well as in the coordination between actors involved and the participation of further stakeholders (Gaus et al. 2019). Another important milestone in the German adaptation policy is the second progress report on the DAS published in 2020, which, in addition to setting political priorities for the next phase of adaptation policy, also contains the updated Adaptation Action Plan (APA III). Together, the core elements of the progress report form the framework for action of climate adaptation policy in Germany for the coming years.

In the context of the DAS strategy process and the identification and selection of concrete measures, various actors are relevant. While the development of the DAS took place within the framework of an informal working group, the first APA was already developed by the Interministerial Working Group on Adaptation (IMAA) established in 2009, which serves the interministerial coordination and further development of the DAS, and was adopted by cabinet decision in 2011 (The Federal Government 2011). The decision to replace an informal working group with the IMAA formally anchored climate adaptation in the political agenda of the federal ministries (Hustedt 2014). The DAS strategy process is accompanied by scientific advisory processes, including the framework of the Climate Impact and Risk Analysis 2021 (KWRA), the aim of which is to develop an updated overall picture of Germany's vulnerability to climate change across all action fields, following on from the Vulnerability Analysis (VA) of 2015. In addition to interministerial cooperation and dialogue with the public, another central component is close cooperation with the relevant federal authorities and institutions. An important institution in the context of climate adaptation policy in Germany is the Network of Authorities for Climate Change and Adaptation. This IMAA-mandated network currently consists of 28 federal authorities and institutions (as of February 2020). It supports the technical input and coordination of scientific content of the central products of the DAS and has already developed a proposal of suitable policy instruments for the Adaptation Action Plan III (APA III) in the updating process of the action plan (Hetz et al. 2019).

Considering the destructive floods in the west and south of Germany in July 2021, the challenges that climate adaptation policy must address have gained further importance in political and

social awareness. It is therefore even more important to critically examine the existing processes and institutions of climate adaptation policy and identify potential for further development and optimisation.

This final report is part of the research project "Network of Authorities for Climate Change and Adaptation – Methods to Support and Improve the German Climate Change Adaptation Strategy" commissioned by the UBA. Using various methodological approaches for analysis, it presents the potential for such optimisations and derives recommendations for the further development of the DAS and related processes. A particular focus of the development of recommendations was on the structures and work of the Network of Authorities for Climate Change and Adaptation. In the context of updating the DAS and preparing the APA III, this body implemented a procedure for the structured assessment and selection of policy instruments (see Hetz et al. 2019). This report refers to the procedure and its potential for optimisation on several occasions, and provides suggestions for further development and improvement.

For example, policy design research provides useful guidance by systematically developing a typology of types of policy mix, which has not been widely considered in the development of action plans in climate adaptation. By considering the distinction between instrument mix and policy mix, an improved systematic understanding of the objectives, instruments and measures that make up a policy mix can be achieved. Furthermore, numerous aspects can be derived from the comparative analysis of the DAS with a number of policy strategies at the German federal level that appear suitable for transfer to the policy field of climate adaptation. The comparative policy field analysis also reveals points of contact for the further development of the Network of Authorities for Climate Change and Adaptation.

This report on the further development of the German Adaptation Strategy (DAS) and its policy mix is divided into three parts. First, a literature analysis of different strands of policy design research is conducted. After the description of the methodological approach of the literature analysis, the scientific-theoretical approaches of policy design research, governance research as well as transition and strategy research are discussed with the aim of identifying possible starting points for the transfer to the policy field of climate adaptation. In the summarising conclusions, the core aspects from the literature analysis are presented with regard to the described objective.

Another component of the report is a **comparative policy field analysis** of different federal strategies, on the basis of which possibilities for optimising the action planning process, stakeholder participation and the steering of the DAS process are to be identified. To this end, the methodology is first explained in detail, followed by the results of the analysis, which are divided into three main areas. The conclusion of this part summarises the results of the analysis and presents concrete recommendations for optimising the relevant processes.

Based on the results of the previous analyses, **recommendations for the further development of the policy mix for DAS** are formulated in the last part. Here, the evaluation and selection processes of adaptation measures are specifically addressed. This is followed by explanations on the procedure for designing a policy mix and on the topic of stakeholder involvement and integration of participation processes. In the further course, it is shown how the integration of different vertical levels can be improved, before the importance of a new vision and goal definition process is emphasised in the last section.

Within the framework of the "**Methodological Analysis of Policy Design**", the project examined various scientific-theoretical approaches to the development and evaluation of a policy mix, policy design and related research strands. The aim was to identify approaches based on a literature analysis that appear suitable for transfer to the policy field of climate adaptation.

Such starting points can, for example, be of a methodological, process-oriented and institutional nature. With this objective in mind, the following conclusions can be drawn:

1. *Policy design research* has dealt intensively with the elaboration of a complex policy mix typology. This typology allows to distinguish between analyses and evaluations of single instruments, combinations of instruments and types of a policy mix in the narrower sense. Depending on what is being evaluated (a single instrument, a combination of instruments with regard to one goal or several goals, a specific policy mix type), systematic consequences arise for the application of criteria such as effectiveness, flexibility, efficiency, coherence and synergy potential in the development of policy instrument proposals, not least in the Network of Authorities for Climate Change and Adaptation.
2. For the analysis of process-related starting points in climate adaptation networks and with regard to institutional factors, *governance research* appears suitable, whereby a narrow understanding of governance as a network-based form of coordination is preferable to a broad understanding that tends to be diffuse. The literature analysis underlines the high importance of distinguishing between types of networks. For the Network of Authorities, it is assumed that especially the two types "service delivery and implementation" (in the sense of an implementation network) on the one hand and "collaborative and network governance" (in the sense of a governance network) on the other hand are significant. This distinction results in important starting points for the further development of the Network of Authorities. This can be seen, for example, in the weighting of evaluation criteria. Thus, implementation networks emphasise criteria such as effectiveness and efficiency; governance networks, on the other hand, emphasise criteria such as synergy potential and innovation. In reality, however, mixtures of network types are also to be expected, which in turn results in challenges for the management of a network (e.g. allocation of criteria, content and activities in network management).
3. Climate adaptation policy also has a strong long-term component "by nature", so to speak. *Transition and strategy research* differentiates to a greater extent than policy design and governance research between different time horizons of concepts and pays more attention to long-term vision-driven change processes. The literature analysis therefore also included current review articles on transition and strategy research. This revealed that transition research primarily promotes an understanding of disruptive regime change and possible windows of opportunity. Preparation for such windows of opportunity tends to require adaptive strategy processes in the sense of strategy research.

Policy design research is particularly convincing due to the systematic development of a complex typology of types of policy mix. Previous UBA projects on action planning related to the DAS have either completely ignored this typology (e.g. Blobel et al. 2016) or only rudimentarily considered it (e.g. Hetz et al. 2019). In their publication on the "Proposal for a Policy Mix for the Climate Change Adaptation Action Plan", Blobel et al. (2016) focus on the combination of control instruments and climate adaptation measures. The fact that the *term "policy mix" according to policy design research actually requires the combination of at least two "policies"* was not taken into account. Hetz et al. (2019) go into more detail on the various possibilities of designing a policy mix, but do not systematically use the distinction between instrument mix and policy mix.

The Network of Authorities has increasingly addressed issues of developing a policy mix for climate adaptation. However, the policy mix typology of policy design research was not taken into account comprehensively and systematically (cf. Hetz et al. 2019). To summarise and simplify, it is possible to state that questions of the combination of "policies" have so far been dealt with primarily as questions of the combination of policy instruments. The Network of Authorities has thus dealt with combinations of instruments, rather than with the systematic

linking of "policies". Interdependencies between the goals and instruments of different policies were reflected in the selection of criteria for the analysis and evaluation of instruments (the criteria of effectiveness, flexibility, efficiency, coherence, synergy potential, cf. Hetz et al. 2019). The application of the criteria to selected action fields in climate adaptation led in particular to statements on individual instruments and only supplementary and rudimentary consideration of instrument combinations in the different action fields.

Against this background, it is obvious to assume potentials for the transfer of policy design research above all in the systematic application of the policy mix typology to the design of the procedure for the analysis and evaluation of policy instruments. Such a transfer would be reflected above all in the innovative further development of the procedure in the form of a modified use of criteria for the evaluation of policy instruments:

- *Analysis and evaluation of individual instruments:* The previous procedure for supporting DAS action planning has proven its worth, especially with regard to individual instruments. Through the development and testing of the procedure, numerous empirical values on the concrete implementation of the procedure and indications for procedural improvement could be gathered (cf. Hetz et al. 2019). Such improvements concern, for example, the understanding between the network partners of the tasks and roles of the individual partners and the network as a whole, the understanding and concrete application of the five criteria on policy instruments and numerous details on the rather "technical" implementation of the procedure.

- *Analysis and evaluation of instrument combinations:* However, questions of a mix of instruments in the action fields of climate adaptation were not the focus of the procedure practised so far. In the course of the analysis and assessment of individual instruments, (1) references to overarching policy instruments were collected (e.g. basic climate services) and (2) only *supplementary* assessment judgements on the combination of instrumental statements were developed *after* the assessment of individual instruments. The use of policy design research for the further development of the procedure would already lead to significant procedural changes in the more intensive and to a higher degree systematic analysis and evaluation of combinations of instruments. This would affect, for example, the type of objective formulation for the application of the criterion of effectiveness as well as the assessment of interdependencies between several instruments. Thus, evaluations of combinations of instruments under the criterion of effectiveness are facilitated by an objective formulation that is as concrete and unambiguous as possible. This suggests that combinations of instruments should be evaluated in an effectiveness-oriented manner, *if possible under only one set of objectives* and not with several objectives. The set of evaluation criteria would also have to be extended with regard to several instruments by the criterion of consistency. *Within the framework of the procedure, a clear distinction would have to be made between the coherence of objectives and the consistency of instruments.* Overall, it can be seen that the systematic consideration of policy design research should already lead to significant, if not fundamental, changes in the procedure within the framework of the Network of Authorities with regard to combinations of instruments.

- *Analysis and evaluation of types* of policy mix*:* Of the policy mix types, two are presumably of particular importance for DAS: the "classical policy mix" (type IV: multiple policies, objectives and *one* level of strategy development) and the "cross-level complex policy mix" (type VIII: multiple levels, objectives and "policies"). Policy design research argues, however, that the complex strategy for multiple policies and levels faces particularly high challenges of effective realisation. Especially for cross-departmental strategies and strategies related to

several spatial-institutional levels, this raises the question of how *ambitious* the claim of cross-cutting orientation is chosen (cf. Vetter et al. 2017). Compared to the analysis and evaluation of instrument combinations, the further development of the procedure on policy instruments in the Network of Authorities as a policy mix is even more ambitious. There are numerous reasons for this, one of which will be brought to the fore in the following: Contributions of the Network of Authorities to the realisation of a policy mix already require in the case of Type IV the elaboration of a coherent target system across at least two "policies". Questions of the consistency of instruments can only be systematically addressed after the analysis of a complex set of more or less concrete target statements (cf. Hetz et al. 2019). Contributions of the Network of Authorities to combinations of instruments as components of a policy mix thus presuppose the stronger differentiation of the analysis between policies, goals and policy instruments. The previous procedure would have to be revised to a large extent, if not fundamentally, for such an evaluation task.

The DAS is a horizontally and vertically complex strategy process. Horizontally, this complexity results from the high number and variety of action fields of climate adaptation as presented in the overview in the central strategy document from 2008 (Die Bundesregierung 2008). The term "action field" is less presuppositional than the term "policy". A policy requires the existence of a target and means statements on several levels of abstraction. The term "action field", on the other hand, focuses on instruments and measures - without specifying the need for the existence of abstract *and* concrete target statements. Vertically, this high complexity results from the different spatial-institutional levels of the DAS and the actors who play central roles at these levels. A high degree of complexity also results from the fact that the historical and factual-spatial conditions of climate adaptation can take on different characteristics depending on the action field and concrete political-administrative problem and interact in many ways. For example, there is already a great deal of experience with strategies for river floods at the municipal level as well as at the levels of federal and state policy - not least as reactions to the river floods of the Elbe and its tributaries in August 2002. In comparison, the heatwave summer in 2003 triggered fewer reform activities. In comparison, the heat summer in 2003 triggered less reform activity. However, precautions for heat stress in urban areas and dealing with heat waves have been gaining importance in recent years based on empirical values with recurring heat summers. The catastrophe in the Ahr valley as a result of a heavy rain event in 2021 has brought home the necessity of intensified strategy development for the reduction of heavy rain risks. For the reduction of river and heavy rainfall risks, the consideration of factual-spatial differences between these two types of environmental risks is of high importance (e.g. typical river flood risks as risks that can be more spatially and factually delimited in the medium to long term compared to heavy rainfall risks, which in principle can occur ubiquitously).

Policy design research has developed an understanding of policy mix that corresponds precisely to this high complexity. For the DAS as a whole, it should therefore be assumed here that policy design research provides foundations for proportional policy design in the practice of climate adaptation policy. How these foundations are used depends in particular on the concrete goals for the further development of the DAS. Here, too, it makes sense to differentiate the transfer potential of policy design research according to individual instruments on the one hand and instrument mix and policy mix on the other.

The overall conclusion is that the concepts of policy design research should be included in the further development of the DAS. Only the orientation towards individual instruments, combinations of instruments and options for a policy mix allows the flexibility in policy design necessary for effective climate adaptation policy.

Governance research sheds light on processual starting points in the further development of the DAS, the Network of Authorities for Climate Change and Adaptation in particular (e.g. network management strategies, collaborative governance episodes). However, there are also institution-oriented starting points, because the distinction between a network as an implementation network or governance network (in the sense of the network type "collaborative and network governance", Klijn und Koppenjan 2016) is important for the collective identity of the network of authorities, and such an identity has numerous references to institutional arrangements of the DAS (e.g. mandating of the network of authorities). Institutional starting points also need to be considered in multi-level governance and metagovernance.

Governance as network-based coordination goes beyond individual networks (such as the Network of Authorities) and addresses wide-ranging relationships of actors at the spatial-institutional levels of the DAS. The policy mix typology of policy design research also addresses, as mentioned, options for vertical levels (e.g. type VI as sectoral policy mix and type VIII as maximum programme of policy integration).

The policy feedback model by Tosun und Treib (2018), among others, appears suitable for the transfer of multi-level governance research. According to Tosun und Treib (2018), policy feedback processes for "policies" with a pronounced purpose rationality require a certain limitation of decentralised scope for actors at the level of implementation. Limitations may lie in policy content and the number and institutional characteristics of actors, to name just three examples of types of constraints on implementation. Policy feedback processes that place more emphasis on exploring new instrumental possibilities, adapting to different framework conditions and allowing implementation actors degrees of freedom would require decentralised implementation structures. In questions of the implementation of policy goals and instruments in the DAS action fields, a distinction would thus also have to be made as to whether criteria such as effectiveness are in the foreground (then presumably centralised implementation, if this is compatible with efficiency arguments, e.g. with regard to the use of economic instruments) or whether decentralised experiments and diversity of content should provide a "breeding ground" for future innovations (then decentralised implementation). Beyond a mix of network types, the further development of the DAS would also be about designing the combination of different implementation structures.

Policy design and governance research on the one hand and **transition and strategy research on** the other hand differ in their perspective. Policy and governance researchers look from the perspective of politics and administration at societal framework conditions and their changes. Transition and strategy researchers look at the long, medium and short-term goals, instruments and measures in civil society, the economy, politics and administration, etc. contained in social change processes. Transition research distinguishes more systematically than policy design and governance research between short-, medium- and long-term concepts (cf. Loorbach et al. 2017, Köhler et al. 2019). However, there are also numerous overlaps between policy design and governance research and transition and strategy research (cf. Köhler et al. 2019). For Loorbach et al. (2017) governance belongs to the "heart" of transition research.

Work on DAS already uses the distinction between incremental and radical change processes (cf. e.g. Mahrenholz et al. 2017). This distinction offers a starting point for the in-depth analysis and interpretation of the transfer potentials of transition and strategy research. For the DAS, it would be of interest to know which forms of the observed and expected change can be observed in the DAS action fields. In addition, it would be interesting to see whether disruptions and the reactions to and strategies for disruptions differ systematically according to action fields. The transfer of transition and strategy research specifically to DAS would translate into new

empirical findings on the description and explanation of change processes (cf. Turnheim et al. 2018). More knowledge on already ongoing and possible future disruptive change processes in the DAS action fields would be an important basis to prepare climate adaptation policy for the medium- and long-term use of windows of opportunity for the realisation of *its* goals.

The transfer potential of transition and strategy research for the Network of Authorities for Climate Change and Adaptation depends to a large extent on how the network is dealt with as an implementation and governance network:

- If the Network of Authorities is primarily an *implementation network* and is to be managed rather traditionally, primarily on the basis of the criteria of effectiveness, flexibility and efficiency, it is *not* obvious to assume that there are many starting points for the transfer of transition and strategy research. The further development of the network would be sufficiently possible by means of the transfer of policy design and governance research.
- If, however, the Network of Authorities were to take criteria such as coherence and synergy potential into account to a greater extent than has been the case to date, and were also to pursue a higher level of ambition with regard to its contribution to radical change processes in the sense of long-term climate adaptation, there would presumably be more transfer potential for transition and strategy research.

Ultimately, the decisive factor is once again (as already mentioned above) the weighting of evaluation criteria for the further development of the network within the framework of the DAS - not only with regard to the development of proposals for policy instruments, but also for the development of the network as a whole.

The aim of the **comparative policy field analysis,** which is described in Chapter 3, was to identify starting points for optimising the action planning process, stakeholder participation and steering of the DAS process by comparing the DAS with other federal strategies. At the beginning of the analysis, other cross-departmental and cross-level federal strategies were selected and compared with the DAS. Based on a literature and document analysis as well as interviews with experts, indications for an optimisation of the DAS and APA process were elaborated. Of particular importance were questions of actor cooperation, coordination and dialogue processes, which led to a selection of measures for the implementation of the strategy. The question of how diverging actor interests are balanced within this process, or the question of which methodological and institutional anchoring characterise the procedure, were of specific analytical relevance. Also of analytical interest were indications of which selection criteria were applied for the prioritisation of measures. The results served to optimise the strategic development and implementation of the DAS.

In addition to the success factors that apply to the broad range of strategy processes (e.g. cooperation and coordination between participating ministries, successful course of an action planning process, work of networks and committees), various indications specific to the further development and optimisation of the DAS process can be derived from the comparative policy field analysis. For reasons of clarity, these are divided into procedural, methodological and institutional aspects.

The **process of action planning** includes the selection and, if necessary, evaluation and prioritisation of measures. Here, an integrative procedure for the joint development of measures, bundles of measures or core projects by departments and stakeholders promises opportunities for further processual development. In order to ensure a functioning workflow in such a comprehensive procedure for stakeholder involvement, a subdivision into thematic working groups is suitable.

The decision on which stakeholders to involve in the process should be based on an initial structured query of all relevant stakeholders to obtain feedback on who is interested in such involvement. The distribution lists of the relevant BMU and UBA departments as well as an online announcement could be used for this query.

Beyond the public authorities' network on climate change and adaptation, the involvement of stakeholders has so far primarily been selective and not institutionalised. This can be change d in a further development of the process and an established, structured participation process, as it is set up in numerous other strategies, can be established. Such a comprehensive stakeholder dialogue includes long-term committees with regular meetings, defined work output and tasks, coordination by a separate office and regular exchange with the departments. Such a comprehensive stakeholder dialogue includes various working groups and formats that can be flexibly adapted according to the work assignment and process phase. In this way, an important basis can be created for the further development process of the DAS and the measure selection process under the APA.

In addition to clear target agreements, the APA should also specify clear responsibilities for the implementation of measures and contain time and work plans. For the entire process, it should be ensured that it is clearly communicated how the respective input is further used by the departments or IMAA.

Public attention for the policy field of adaptation to climate change has risen sharply in recent years. In order to take account of this increased interest and to address the associated need for information, a central internet presence for the DAS and the associated processes and portals can be established.

In terms of methodology, it is primarily possible to derive indications for optimising an evaluation and prioritisation procedure for adaptation measures. For an evaluation procedure of proposed measures, the results of the analysis provide information on suitable evaluation criteria that can be applied in such a procedure. So far, this procedure has not considered the administrative and political feasibility of measures, including implementation costs, as well as macroeconomic effects such as distributional and regional policy effects. With a new procedure, at least some of these factors can be considered and included in the assessment. A helpful addition to the evaluation criteria is the provision of guiding questions that help participants to classify criteria.

There are various possibilities for prioritising proposals for measures that are made within the framework of a recommendation by the Network of Authorities or any other bodies, if such further development is desired. It is conceivable to define a number of measures to be implemented as a priority on the basis of the assessments submitted. A predefined number of measures that have received the highest rating are passed on as priorities accordingly. Alternatively, points can be awarded, where stakeholders can identify a certain number of measures as priorities by awarding points. The measures that have received a point from the most stakeholders are then listed as priorities. Both of these proposals can be implemented without significant additional effort as part of the selection and evaluation process of the Network of Authorities. In this case, it would be important that the resulting priority measures are also listed as such in the APA and thus highlighted from the plethora of measures listed.

An alternative further development of the APA could also be achieved through the development of clearly defined core projects. A limited number of such detailed core projects allows for a focussing of activities and at the same time increases the visibility and accessibility of the measures.

An institutionalised extension of the existing participation process is suitable for the integration of stakeholders into the DAS and APA process. One possibility for such an expansion is a broadening of the Network of Authorities by adding representatives of municipalities, Länder, civil society and business. However, this can easily overload the structure and functioning of the network. A better option is therefore a stakeholder body that complements the network. While the network of public authorities is similar to a council of experts (albeit with a higher number of members), a stakeholder forum can ensure the continuous involvement of a wider range of stakeholders.

For the Network of Authorities itself, a clear objective and functional description should be developed and, if necessary, recorded in the form of rules of procedure.

For the composition of a stakeholder forum, a systematic and transparent selection of stakeholders should be made. Based on a general enquiry as to which stakeholders would like to be involved in such a process, a selection can be made to ensure that all relevant stakeholder groups are represented and that positions/stakeholder groups with few resources are also integrated. In order to arrive at a manageable size, the stakeholders involved should be divided into substantive working groups. In these working groups, an overlap with the Network of Authorities is conceivable and makes sense. Topic-specific cooperation in working groups has the potential to simplify coordination processes and to bundle expertise. The outputs generated in working groups should in turn be discussed in plenary in order to create a coherent overall process.

In addition, selective participation through events should also be maintained. In the course of the analysis, the importance of a platform for the exchange and networking of actors was emphasised several times.

A more fundamental reorientation of the DAS and the APA itself is also recommended based on the results of the analysis in order to achieve a higher level of ambition in German climate adaptation policy. The already noticeable impacts of climate change mean an increased need for the implementation of effective adaptation measures. The transition of the DAS into such an implementation-oriented phase requires a stronger political backing and a corresponding institutional suspension. A strategic reorientation of the DAS along guiding principles or core objectives developed in cooperation with IMAA and other stakeholders is therefore recommended. This would allow a bundling of activities and actors as well as the linking of different levels, specifically the levels of the Länder, municipalities and civil society. With the help of a clear definition of goals, the joint pursuit of these goals by participating stakeholders would be promoted, as would the development of stronger implementation and cooperation dynamics. Focusing activities along missions or core projects would also increase the visibility and external impact of German climate adaptation policy. Thus, one of the most common challenges that became apparent in the strategy processes studied could be addressed: Ensuring effective coordination of the many individual measures among each other and the precise targeting of numerous activities. This would also allow conflicting goals to be addressed earlier and synergies to be utilised. Such overarching guiding principles should be developed jointly with input from the Network of Authorities, experts and other stakeholders.

The **recommendations of the present report for the further development of the DAS** are aimed at various aspects of adaptation policy. These include the assessment and selection processes of adaptation measures for the APA, the processes for stakeholder engagement and participation in developing a policy mix, and improving the integration of different vertical levels.

For the **selection process of adaptation measures,** the report highlights the advantages of an integrative approach and argues for broadening the scope of stakeholder participation. Involving a broader range of actors both increases the quality of adaptation planning and promotes wider acceptance of the measures. Even beyond the selection process, the report recommends making stakeholder participation processes permanent throughout the action planning process and further DAS processes. The establishment of a stakeholder forum with associated working processes is one way to institutionalise and consolidate this involvement of and coordination with relevant actors. The permanent involvement of stakeholders described here, in combination with complementary dialogue processes, represents a sensible further development of the DAS process and can increase its legitimacy, acceptance and visibility.

The selection of new policy instruments and measures within the framework of an optimised policy mix in climate adaptation also requires a detailed consideration of existing measures. Otherwise, a so-called "layering" may occur, in which new instruments and combinations of instruments are added to already existing policy instruments without implementing an overarching consideration of possible interactions and long-term consistency between these instruments (Ekvall et al. 2016). To avoid this, the results of the KWRA can be used, as the urgent and very urgent needs for action derived there highlight the gaps in existing adaptation planning that should be focused on when selecting new instruments. Furthermore, a selection of prioritised core projects is recommended in order to be able to focus on certain measures and to increase the visibility and accessibility of adaptation policy.

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Another suggestion for improvement concerns the **(vertical) integration of different levels**. In order to avoid fundamental questions of vertical policy integration that are difficult to answer, the identification of suitable example topics is a good idea, which can be used to demonstrate a possible coordinative approach. In addition, the level of the federal states can be included in the work of the Network of Authorities in order to achieve an optimised coordination of the APA with the adaptation activities taking place at the level of the federal states. In this context, a stronger link between the needs of the municipalities and action planning at the federal level would also be advocated.

As a final aspect within these recommendations for the further development of the DAS, a **clearly defined objective** is emphasised as a decisive success factor for the planning of measures. This facilitates coordination between the political levels and the actors involved. Tangible key objectives are essential for initiating profound transformative processes in climate adaptation.

1 Introduction

In addition to limiting global warming to below 2°C compared to pre-industrial times – or even 1.5°C if possible – the issue of adaptation to climate change was a major goal of international climate negotiations and became a key part of the ground-breaking Paris Agreement in 2015. Even if we succeed in limiting global warming, greenhouse gases that are already in the atmosphere will influence the climate for decades to come. In fact, for the first time, the Global Risks Report released by the World Economic Forum in 2020 featured only environmental risks in the top five places of the most likely risks over the next decade – failure to mitigate and adapt to climate change were named as the top long-term risk (World Economic Forum 2020). The initial effects of climate change, such as heat waves in summer and more intense storm events with heavy rain and flooding, are already noticeable and are likely to increase in the future. These climatic changes pose major challenges for Germany and make adaptation a necessity.

The Federal Government's Climate Change Adaptation Strategy (DAS) from 2008 represents a key starting point to face these challenges. Along with the Adaptation Action Plan (APA) adopted in 2011, it forms a cornerstone of the long-term process of adapting to climate change in Germany. With the formulation of goals and options for action, the DAS sets a national strategic framework to reduce the vulnerability of the economy, environment and society to the consequences of climate change. In the meantime, this strategy has been underpinned by three action plans and has been subject to continuous development. With the third Adaptation Action Plan (APA III), German adaptation policy shifted from a research-focused to an implementation-oriented phase.

The evaluation report on the DAS strategy process published in 2019 rates the framework conditions of the strategy process as positive overall, but identifies a need for improvement in the identification and selection of suitable policy instruments, a clear definition of the target system and the coordination between the actors involved as well as the involvement of other stakeholders (Gaus et al. 2019).

The second progress report on the DAS (2020) represents an important milestone in German adaptation policy. In addition to setting political priorities for the next phase of adaptation policy, it also contains the updated Adaptation Action Plan (APA III). The core elements of the progress report form the framework for climate adaptation policy in Germany for the next few years.

Various actors are relevant in the context of the DAS strategy process and the identification and selection of concrete measures. While the DAS was still being developed within the framework of an informal working group, the Interministerial Working Group on Adaptation (IMAA) was already working on the first APA, which was adopted by cabinet decision in 2011. The IMAA was established in 2009 for the cross-departmental coordination and optimisation of the DAS. (Die Bundesregierung 2011). The decision to replace an informal working group with the IMAA formally anchored climate adaptation in the political agenda of the federal ministries (Hustedt 2014).

The DAS strategy process is accompanied by scientific advisory processes, including as part of the Climate Impact and Risk Assessment 2021 for Germany (KWRA), the aim of which is to build on the Vulnerability Analysis (VA) from 2015 and provide an updated, interdisciplinary picture of Germany's vulnerability to climate change. In addition to the interministerial cooperation and the dialogue with the public, another key component is the close cooperation with the relevant federal authorities and institutions.

A central actor in the context of climate adaptation policy in Germany is the Network of Authorities for Climate Change and Adaptation. The network was mandated by the IMAA and currently consists of 28 federal agencies and institutions, five of which have observer status (as of February 2020). It supports the technical input and coordination of scientific content of the central products of the DAS and has already developed a proposal for suitable policy instruments for the APA III in the process of updating the action plan (Hetz et al. 2019).

The project "Network of Authorities for Climate Change and Adaptation – Methods to Support and Improve the German Climate Change Adaptation Strategy", carried out by adelphi research gGmbH and the Leibniz Institute of Ecological Urban and Regional Development (IÖR), provided methodological and technical support for the optimisation of the DAS. The aim of this research project was to accompany the progress of the DAS from a research- to an implementation-oriented phase and to identify options for the institutional, procedural and methodological improvement of the DAS. The methodological approach was based on a literature analysis of policy design research and related research areas as well as a comparative analysis of policy fields.

The development of recommendations focussed in particular on the structure and work of the Network of Authorities for Climate Change and Adaptation. As part of updating the DAS and the creation of the APA III, this committee implemented a procedure for the structured evaluation and selection of policy instruments (see Hetz et al. 2019). This report references that process and its potential for optimisation multiple times and provides suggestions for further development and improvement.

Structure of the report

This report on the German Adaptation Strategy (DAS) and its policy mix is divided into three chapters. It begins in Chapter 2 with a method analysis of policy design, or a policy design transfer to the field of climate adaptation by way of an analysis of the literature. After the description of the methodological approach in the literature analysis, the report explores the scientific-theoretical approaches of policy design research, governance research as well as transition and strategy research. The aim here is to identify possible starting points for the transfer to the policy field of climate adaptation. The summarising conclusions that follow present the core aspects of the literature analysis with regard to the described objective.

Chapter 3 of this report provides a comparative analysis of various federal political strategies; this enables the identification of opportunities for optimising the action planning process, stakeholder participation and the management of the DAS process. To this end, the report starts with a detailed explanation of the methodology and then presents the results of the analysis, divided into three main points. The conclusion of the third chapter summarises the results of the analysis and presents concrete recommendations for optimising the processes.

Based on the results of the previous analyses, Chapter 4 formulates recommendations for the further development of the DAS policy mix. The first section of the chapter deals specifically with the evaluation and selection processes of adaptation measures. This is followed by explanations on how to proceed when designing a policy mix and on the subject of stakeholder involvement and the integration of participatory processes. The report then shows how the integration of different vertical levels can be improved, and the final section emphasises the importance of a new process for defining the vision and goals.

2 Methodological Analysis of Policy Design

The project "Network of Authorities for Climate Change and Adaptation – Methods to Support and Improve the German Climate Change Adaptation Strategy" examined various scientific and theoretical approaches to the development and evaluation of policy mixes, policy design and related research. The aim of the "Methodological Analysis of Policy Design" mentioned in the summary was to use a literature analysis to identify starting points for transfer to the policy field of climate adaptation. Such starting points can, for example, be of a methodological, process-oriented or institutional nature.

This chapter begins with an explanation of the methodological approach to the literature analysis, including a discussion of the conceptual approach and the content-related systematics, as well as the selection and evaluation of literature articles. The following section is dedicated to policy design research and, in addition to the complex typology of different types of policy mixes, addresses the transfer potential of this research for the further development of the DAS. It then treats governance research as well as transition and strategy research in the same way. The chapter closes with some conclusions.

2.1 Methodological approach to literature analysis

2.1.1 Conceptual approach and content systematics

The terms "method" and "methodological" have multiple meanings:

4. In a broad sense, "method" or "methodological" generally means a systematically comprehensible solution that can be applied to the DAS action fields.
5. The terms "method" and "methodological" are to be understood in a narrower sense as a "toolbox of methods" with which actors can strive to solve problems for the federal action plan for climate adaptation based on the structures of the DAS.
6. When evaluating research, it is also possible to speak of methods of empirical research (e.g. certain forms of expert interviews, certain research designs, cf. Ven 2007).

The DAS is a thematically, procedurally and institutionally complex process (cf. Vetter and Schauser 2013, Vetter et al. 2017, cf. Figure 1 below). The following is primarily devoted to methods in the narrower sense as well as procedural and institutional solutions for DAS action planning (cf. Hetz et al. 2019, further explanations below).

When transferring approaches from policy mixes, policy design and related research areas to climate adaptation, it is important to name the actors at the centre of the transfer. In accordance with the title of this final report on the project "Network of Authorities for Climate Change and Adaptation – Methods to Support and Improve the German Climate Change Adaptation Strategy", the focus is on this network of authorities when it comes to questions of transfer.

The policy design method analysis for the DAS aims at an *innovation-oriented* evaluation of research to identify starting points for the further development of the federal action plan. The literature analysis is intended to identity *novel* starting points for changing the action plan, which in turn (could) lead to *improvements* in the DAS. A distinction must be made between incremental and radical changes (cf. Mahrenholz et al. 2017 on climate adaptation in the context

of institutional, sociocultural and historical conditions). However, there are also innovations that fall *between* incremental and radical changes. (cf. e.g. Tushman and Smith 2002; 392ff.).

The analysis also takes into account other types of research in addition to policy design research.[1] These include governance, transition and strategy research. However, a certain priority is given to policy design research, since its focus on the content of policies is of particular importance to strategy development for climate adaptation. For this reason, the "Methodological Analysis of Policy Design" does not cover only one type of research (e.g. strictly policy design research *or* governance literature) in the analysis. There is also no meta-theoretical analysis of research (as presented by Sørensen and Torfing in "Theories of Democratic Network Governance" for example). This raises the question of how the four relevant types of research (policy design, governance, transition and strategy) can be analysed in a comparative manner. The following explains the conceptual framework that guides the comparative literature analysis on the types of research.

2.1.1.1 Conceptual framework

The DAS is a complex strategy process that involves numerous actors on multiple spatial and institutional levels (see Figure 1).

Figure 1: Overview of the actors in the DAS process

Source: Gaus et al. 2019; p. 36.

From a policy design perspective, all types of actors and spatial-institutional levels are potentially of interest. This is because policy design research also addresses the fundamental premises with which the complexity of policy content, processes and institutions (like the DAS) can be reduced to a "manageable" level (cf. Howlett 2019a, Howlett and Mukherjee 2018c). Governance research in general (e.g. Ansell et al. 2017b), and research on climate governance in particular (e.g. Turnheim et al. 2018), addresses the diversity of actors, spatial-institutional levels and processes. The same applies to strategy research (e.g. Hutter et al. 2019) and transition research (e.g. Geels 2011, Loorbach et al. 2017). The four types of research on policy design, governance, transition and strategy show a remarkable theoretical and conceptual diversity; they are therefore not to be understood as narrowly defined strands of research with a high degree of homogeneity.

[1] Research on individual policy instruments and combinations of instruments is a core component of policy design research (see below).

In order to deal appropriately with this theoretical and conceptual variety, this report takes a more limited conceptual perspective – in line with the goals of the project – which is characterised by three features:

- *Actor-related perspective:* The actors in the DAS process presumably perceive this process differently (cf. Hustedt 2014 to the Interministerial Working Group on Adaptation (IMAA)). With regard to the project goals, the focus on the perspective of selected actors is obvious. The UBA and the BMU play central roles in the further development of the Network of Authorities for Climate Change and Adaptation. This applies not least to the realisation of the cross-departmental claims of the network of authorities (cf. Vetter and Schauser 2013). However, networks in general, and the network of authorities in particular, are also based on the intensive involvement of network partners (NWP) in their functioning. This means that, in addition to focusing on individual actors, it is necessary to address the interaction of the actors from the point of view of the entire network (cf. e.g. Klijn 2008, Klijn and Koppenjan 2016).
- *Procedural perspective:* The "Methodological Analysis of Policy Design" follows a direction of analysis that Selle (2007) identifies as a procedural perspective, i.e. of primary interest are a particular strategy, related voting procedures and policy instruments. This implies special attention to the time dimension of strategy development.
- *Strategic perspective:* The DAS is considered a national political success of integrative strategy development[2] – which does not mean that it cannot be improved. A strategic perspective deals with the question of optimising cross-departmental coordination within the framework of adaptation action plans (in the sense of "positive coordination", Hustedt 2014).

2.1.1.2 Content systematics of the literature analysis

Establishing a conceptual framework is a necessary prerequisite for conducting the comparative literature analysis on policy design and governance, strategy and transition research. This framework is not sufficient, however, because the comparison of the four types of research requires a more structured content analysis of the literature.

The content can be structured using conceptual typologies or quasi-typologies. Collier et al. (2012) note that typologies are not only empirically usable, but can also support the comparative-integrative analysis of research.[3]

Against this background, it is advisable to develop a typology for the systematic content of the literature analysis on policy design and related research. This can clarify the dimensioning of the analysis. Two dimensions are at the forefront of the literature analysis:

- Dimension 1 "Network management in the context of DAS": This dimension concerns the analytical distinction between (1) the internal control of the Network of Authorities for Climate Change and Adaptation under the leadership of the BMU and (2) the DAS as a strategy development for climate adaptation as a whole, which sets a framework for the internal control of the network (e.g. through content-related federal targets for the network of authorities),

[2] Personal communication from Prof. Hustedt as part of the kick-off meeting of the UBA research project "Climate Adaptation Network of Authorities" in Dessau-Roßlau 2018.

[3] For examples, see the much-cited typologies of Borgatti und Foster (2003) on network research, in particular networks in organisational research, Ven und Hargrave (2004) on institutional research, Garud et al. (2013) on innovation research.

- Dimension 2 "Starting points in the DAS action planning process": This applies to the analytical distinction between methodological, procedural and institutional starting points, which has already been introduced and is explained in more detail below.

The resulting 2x3 matrix (see Table 1 below) is used to "locate" articles from the four types of research, policy design, governance, strategy and transition.[4] The strategic perspective contained in the conceptual framework, on the other hand, becomes the "localization" of articles from the four types of research, *deepening* content analysis of the articles with regard to the realization of integrative, in particular cross-departmental, political claims.

Dimension 1 "Network management in the context of DAS"

Networks of authorities face numerous challenges (cf. e.g. Provan and Kenis 2008, Hetz et al. 2019). In particular, it is also an issue of clarifying numerous questions regarding the coordination of the content of the NWP contributions and ensuring that the actors and authorities involved work as intensively as possible on effective, efficient and fair solutions. Before fundamental questions about the performance of a network of authorities are addressed, it is therefore important to explore the *potential for the internal improvement of network management* as exhaustively as possible, above all to optimise the procedure for political instruments.

However, even if the actors involved develop the network in an optimal way, the performance and effectiveness of the network will only improve with specific starting points in the *direct context* of the network, *inside* the DAS, on the whole. This applies, for example, to the specification of content-related goals for climate adaptation by the Federal Government to the network of authorities. The network cannot act autonomously when determining objectives for the assessment of the effectiveness of climate adaptation instruments and action. Instead, given the institutional framework of climate adaptation policy, it must observe politically legitimate targets that are determined as part of the DAS (e.g. by the federal ministries and processes of departmental coordination). This applies, for example, to guarantees about capacities for the network and, where necessary, individual people.

Dimension 2 "Starting points in the DAS action planning process"

The distinction between network-internal management and network context in the sense of DAS specifications for the network as a whole focuses on actors and the "social force field", as shown in Figure 1. The distinction between methodological, procedural and institutional starting points, on the other hand, points to the direction and impact of the solutions that can be sought out in this force field.

- *Methods in the strict sense* here refers to the "toolbox of methods" for content-related articles on DAS action planning (e.g. methods of technical analysis in individual DAS action fields, methods of knowledge integration [cf. e.g. Bergmann et al. 2018], methods of preparing specific content for target groups). An initial assessment of the four types of research suggests that, with regard to methodological starting points, policy research and transition and strategy research are especially useful. Articles from governance research, on the other hand, are often more analytical in orientation (cf. e.g. Klijn 2008, Klijn and Koppenjan 2016, Turnheim et al. 2018).

[4] An example from governance research Klijn (2008; p. 123) distinguishes between three types of networks relevant to policy development and implementation: "policy networks", "service delivery and implementation" and "governance networks". According to Dimension 1, this empirically oriented typology of policy networks *can* be applied to the climate change and adaptation agency network, but not to the DAS process as a whole. The contribution of Klijn (2008) is also to be understood as an analysis of *procedural* starting points (cf. e.g. the distinction between "management of interactions" vs. "management of network" as a basis for a typology of network management strategies, Klijn 2008; p. 133).

- *Procedural* starting points relate to the design of overall and sub-processes in the network and in the network context. This gives rise, for example, to questions of the content-related coordination, acceleration and synchronisation of sub-processes as well as the extension of the process duration for political instruments. Procedural starting points can also play a role overall with regard to increasing the transparency of processes in the network of authorities and within the framework of the DAS. With respect to effectiveness, the issues of consensus building *and* innovation orientation in the network of authorities are of considerable importance, not least in order to make "effective" contributions to DAS action planning. As mentioned above, innovation orientation focuses on new solutions that are new *to the previous DAS process*, and which lead to improvements in climate adaptation. Processes for formulating measurable goals for climate adaptation are currently of particular importance (cf. The Federal Government 2020 in the second progress report on the DAS). Measurable goals *and,* to a large extent, *binding* climate adaptation targets for the addressees of the DAS would be an even more far-reaching innovation. There are numerous articles on procedural starting points in all four types of research.
- *Institutional* starting points can be of great importance at different levels (for an overview cf. Scott 2014). Simplified and expressed with the help of a game metaphor, institutional solutions aim to *change the basic rules of a game* (in cognitive, regulatory and normative terms, Scott 2014). This affects to a large extent questions of transformative climate adaptation in contrast to incremental change (cf. Vetter et al. 2017, Mahrenholz et al. 2017 as Turnheim et al. 2018). Institutional starting points should also include organisational solutions (cf. Mahrenholz et al. 2017).[5] Organisational solutions include, for example, networks with institutionalised sponsorship (cf. Mahrenholz et al. 2017; p. 337) or – in the context of an existing network – certain organisational arrangements for designing and coordinating the activities of NWP (cf. Klijn 2008; p. 133). One example would be the establishment of working groups within an existing network of organisations such as the Network of Authorities for Climate Change and Adaptation. Institutional starting points in the sense of a change in the basic rules that apply to a society or certain areas of society (such as politics, administration, the economy, education, etc.) present the greatest challenges to improving the DAS. In addition, there are institutional processes that require decades to be observed and analysed (as, for example, transition research emphasizes, e.g. Geels 2011, Loorbach et al. 2017). Addressing institutions is particularly necessary for the social and spatial spread and depth of impact of change (cf. Turnheim et al. 2018). As of yet, policy research has only taken limited account of concepts from institutional research (cf. the index in Howlett and Mukherjee 2018c); meanwhile, institutions play a major role in governance research (Wiechmann 2019). Often, institutional research has little influence on strategy research (cf. Hutter et al. 2019), while transition research emphasises the concepts of "regime" and "regime change" (Geels 2011, Loorbach et al. 2017). For this reason, differentiated expectations are needed when considering the four types of research regarding institutional starting points.

2.1.1.3 Typology for the comparative evaluation of the types of research

The combination of the two analysis dimensions discussed results in a typical multi-field matrix (see Table 1).

[5] Mahrenholz et al. (2017; p. 337) distinguish approaches to organisational development from formal instruments (e.g. laws) and informal instruments (e.g. informational tools) as well as economic instruments (e.g. taxes, fees, certificates). Here, on the other hand, organisational solutions should be considered as part of institutional starting points. For the consideration of the policy instruments in the DAS action plan, instruments are classified into regulatory, economic and informational categories (cf. Hetz et al. 2019 for this classification of climate adaptation policy instruments with differentiation into subcategories of instruments).

Table 1: Content systematics of the comparative literature analysis based on two dimensions

Dimension 1 / *Dimension 2*	Internal management of the Network of Authorities for Climate Change and Adaptation	Design of the network context as part of the DAS (e.g. through new targets for the network of authorities)
Methodological	Type 1	Type 4
Procedural	Type 2	Type 5
Institutional	Type 3	Type 6

Source: adelphi.

The systematic content has two main implications:

- *From internal network management to shaping the network context:* Based on this system, typical starting points are initially to be found when dealing with questions such as the optimisation of the Network of Authorities for Climate Change and Adaptation in accordance with their existing mandate and the associated performance expectations (in the sense of "level of ambition", cf. Vetter et al. 2017; p. 331). The focus is on optimising the process for the joint analysis of policy instruments, combinations of instruments and types of policy mix. In addition, there is also the question of how the network of authorities and the procedure can be understood and further developed within the overall DAS context. This currently concerns above all the question of how the assessment of the effectiveness of instruments and measures can be improved through more specific, particularly measurable, adaptation goals (cf. the political priorities in the second progress report, The Federal Government 2020; p. 52).
- *From methodological to institutional starting points:* The consideration of institutional starting points, especially in the sense of starting points for basic rules, is particularly necessary with regard to serious and far-reaching climate risks (Mahrenholz et al. 2017, cf. also Pelling 2011). In practice, however, it is not uncommon for institutional solutions that are theoretically possible and desirable to face particularly high and diverse barriers to implementation. In the internal system, therefore, the first step is to look for potential methodological and procedural improvements and then consider institutional changes.

The systematics of the literature evaluation serves above all as an "analysis tool" and must prove its usefulness in the evaluation of articles from the four relevant types of research.

2.1.2 Selection and evaluation of the literature

The core of the methodological analysis of policy design is (1) based on a systematic literature analysis, the design results of which (2) were critically discussed in the project consortium and intensively coordinated with the client. The selection of documents for the "Methodological Analysis of Policy Design" has a key position in the overall process of this analysis. The document selection is in turn influenced to a large extent by the classification of different document types.

DAS documents, especially those related to the Network of Authorities for Climate Change and Adaptation

Both the objective and the systematic content of the literature evaluation suggest the use of two subcategories when considering documents on the DAS:

- *Documents specific to the Network of Authorities for Climate Change and Adaptation, in particular with regard to the contribution of the network of authorities to action planning:* The documents prepared and finalised specifically for the Network of Authorities for Climate Change and Adaptation are of great importance to the literature analysis. This includes both documents with a typical report and results character (e.g. Hetz et al. 2019)[6] as well as supplementary internal documents (such as minutes of network meetings).
- *Documents on the context of the network of authorities within the framework of the DAS as a whole:* There are a number of basic documents on the DAS as a whole (cf. Vetter et al. 2017 for an overview). The policy cycle character of the DAS is expressed in particular through the progress reporting (cf. The Federal Government 2020).

In agreement with the client of the research project, documents on the DAS were also consulted that address this strategy process from an "external perspective", e.g. through comparative analyses by the "European Environment Agency (EEA)" (cf. EEA 2017) or within the framework of a comparison of national climate adaptation strategies of OECD countries (cf. Mullan et al. 2013, cf. also articles in Keskitalo and Preston 2019).

Policy, governance, transition and strategy research documents

The analysis of the articles on policy design, governance, transition and strategy research should prove effective for the further development of the DAS and the Network of Authorities for Climate Change and Adaptation in particular. It therefore made sense to distinguish different types of documents from the four research areas:[7]

- *Working status of a research area:* Current monographs and reviews reflect the status of the four research areas (e.g. Howlett 2019a, Howlett and Mukherjee 2018c on policy design, Keskitalo and Preston 2019 on "Climate Change Adaptation Policy", Ansell et al. 2017b on "Governance in Turbulent Times").
- *Empirical articles:* Within the individual research areas, there are empirical articles that deal directly with the DAS on the different spatial-institutional levels (e.g. Hustedt 2014, Hutter and Bohnefeld 2013).
- *Specific application:* One argument in favour of selecting a document was that it had specific application to the optimisation and improvement of the DAS (cf. e.g. the distinction between "pilot projects" and "transition arena" in Buuren and Loorbach 2009; p. 380).

For an overview, it is possible to present the references of the selected research articles using a table with 12 fields (cf. Table 2 with examples).

[6] See also the network's proposal on policy instruments for the APA III to the Interministerial Working Group on Adaptation (IMAA), which is only to be used internally by the DAS. The proposal was finalised by the Network of Authorities for Climate Change and Adaptation in the first half of 2019.

[7] It is possible that a single article can be assigned to several document types (e.g. Howlett 2014).

Table 2: Types of documents in policy design, governance, transition and strategy research (with *example* references)

	State of research	Empirical article	Specific application
Policy design	Howlett and Mukherjee (2018c), Keskitalo and Preston (2019)	Hustedt (2014)[8]	Howlett (2014)
Governance	Ansell et al. (2017b)	Turnheim et al. (2018)	Klijn (2008)
Transition	Köhler et al. (2019), Loorbach et al. (2017)	Buuren et al. (2018)	Buuren and Loorbach (2009)
Strategy	Hutter et al. (2019)	Hutter and Bohnefeld (2013)	Healey (2009)

Source: adelphi.

2.2 Policy design research

2.2.1 Designing an effective policy mix

Policy research is a part of political science. Policy design research, in turn, is a subfield of policy research. The term "policy" is usually distinguished from "politics" and "polity". "The aspect of political debate, of conflict, but also of negotiation and consensus-building is referred to in English as *politics*. The substantive aspect of politics, on the other hand, 'the matter', i.e. the concrete material object that is at stake in political debates and decisions, is referred to in English as *policy*." (Blum and Schubert 2018; p. 3, italics in the original) Political debates, consensus building and decisions on content take place in an institutional framework that is referred to as the *polity*.

However, this definition is suitable only for distinguishing policy research from work that deals primarily with political processes and institutions (which does not mean that processes and institutions do not play a role in policy research). In addition to the policy dimension of politics, the term policy can also be understood more specifically. Knill and Tosun (2015; p. 13), for example, note the following: "Policies are measures enacted and implemented by state actors... intended to bring about changes in the behaviour of certain groups in order to solve societal problems in all areas of state responsibility. To this end, political decision-makers determine individual or entire bundles of state measures. Depending on how far-reaching the individual measures are, they can be understood as independent policies either individually or in combination with other measures of policy-analytical research work and treated as dependent variables of the study." (Knill and Tosun 2015; p. 13)

[8] The article from Hustedt (2014) relates directly empirically to the IMA adaptation. It is mentioned here with qualifications because it uses less of a policy design perspective and explores the concept of negative/positive coordination. However, it can be assigned to policy research.

Policy, then, designates a *dimension* of politics, as well as individual or multiple state *actions within this dimension* in a more specific sense. However, as we will see below, policy design research does not use a primarily measure-related understanding of policy (in the sense of Knill and Tosun 2015; p. 13), but a comprehensive means-ends logic to determine individual policies. The concept of design – like the concept of policy – also has a complex history. It also draws on a variety of scientific sources. It is not possible to present them in detail here; instead, we outline the understanding of design developed by authors such as Michael Howlett for policy research (e.g. Howlett 2019a, Howlett and Mukherjee 2018c):

"Policy design…entails the conscious and deliberate effort to define policy aims and map them instrumentally to policy tools that aim to achieve those goals…In this sense, policy design signifies a particular type of policy formulation that involves activities like collecting knowledge about the outcomes of policy instrument use on policy targets and analysing its relevance to the creation and implementation of policies meant to attain specific policy goals and aspirations…" (Howlett 2019a; p. 3)

Above all, this quote is intended to express the means-ends logic, which is of great importance to policy design research. Policy design researchers therefore also emphasize the *priority of the criterion of effectiveness* for the analysis and evaluation of design processes, for the design that results from these processes, and the evaluation of the actual effects of completed designs (e.g. Howlett 2019a; p. 12, Howlett and Mukherjee 2018c). On this basis, it is conceptually possible to distinguish design processes and their results from those political processes that are understood as "non-design".

In terms of a conceptual approach to policy design research, it is sufficient at this point to distinguish between two different problem analyses for policies: (1) the quantitatively oriented analysis of the proportionality of socio-political problems on the one hand and political solutions on the other; (2) the qualitatively oriented analysis of the assessment of the political and "technical" or professional quality of a design.

On 1): policy design researchers do not consistently argue for "more design" in the sense that "more design is always better". If, for the sake of simplicity, a distinction is made between simple and complex design problems on the one hand and simple and complex policies ("policy response") on the other, there are four typical case scenarios (see Table 3). Table 3 indicates that, for policy design research, the *problem of climate change policy might be more of a design flaw*.

Table 3: Cases of disproportional policy reaction and design

Policy design problem / *Policy response*	**Simple**	**Large/complex**
Simple	Proportionate design (e.g. automobile speeding)	Under-design (e.g. climate change)
Large/complex	Over-design (e.g. national security)	Proportionate design (e.g. air traffic regulation)

Source: Howlett 2019a; p. 15 (with minor changes).

However, the diagnosis of "under-design" or "over-design" is still very abstract. The following sections show in detail how policy design research substantiates abstract diagnoses using numerous individual concepts. Only with these individual concepts is it then possible to convert the diagnosis of "under-design" into instructive starting points for specific solutions to climate change problems.

On 2): However, policy design research is not just about "too much" or "too little", but also about the question of how a specific policy design can meet the diverse, qualitatively different requirements that are typically associated with socio-political problems of a certain magnitude and complexity (see Table 4 below). Policy designs can be technically convincing, but have little chance of political support and implementation. Politically convincing and opportune designs can have serious technical shortcomings. Table 4 (below) also mentions the possibility of "poor design". However, it is questionable whether "poor design" is even *design* at all in the conceptual-emphatic sense of the term (see above the quote from Howlett 2019a; p. 3).

Table 4: Capacity issues in policy design outcomes

Governance capacity *(political and operational)* / ***Analytical capacity***	**High**	**Low**
High	*Capable design:* Effective policies are possible	*Poor political design:* Good technical design may have weak support
Low	*Capable political design:* Good political designs are possible which may be technically poor	*Poor design:* Only ineffective and weakly supported policies are possible

Source: Howlett 2019a; p. 126 (with minor, mostly format-related changes).

2.2.1.1 Policy design research as part of policy research

Policy design research is characterised by a high variety of terms. This means that: research (1) cannot be reduced to a few terms and concepts, but tends to develop a kind of analysis language of its own (e.g. "packaging", "smart patching", "Tinbergen rule"); (2) however, this variety of terms is not without structure, whereby historical developments in policy research and current efforts towards consolidation and codification must be taken into account (cf. above all Howlett 2019a and Howlett and Mukherjee 2018c).

In the German-speaking realm, in addition to policy design research, policy field research must also be taken into account, especially with a view to establishing the policy field of climate adaptation (cf. Stecker 2015, Vetter et al. 2017). Blum and Schubert use the terms policy research, policy analysis and policy field analysis to mean the same thing (2018; p. 4). In this scientific final report, however, the terms "policy" and "political field" are to be used in different ways (cf. Stecker 2015):

- A policy includes – similar to Knill and Tosun (2015) – goals, instruments and measures formulated by state actors. The extent to which these instruments and measures are implemented and the changes and experiences produced by that implementation are empirical

questions. In this sense, the content of a policy is determined by the means-ends logic. Policy is formulated within the framework of institutional regulations and, if necessary, on the basis of methods, as well.

- A policy field is "a specific and long-term constellation of interrelated problems, actors, institutions and instruments" (Loer et al. 2015; p. 9). Haunss and Hofmann (2015) argue that policy fields emerge under the conditions of the politicisation of social problems and the "particularity" of problems and their institutionalised solutions. There is special focus here on the demarcation and stabilisation of independent problems, actors, institutions and instruments. The analysis of policy fields is therefore expediently carried out using a meso- or macro-scale approach[9], in order to distinguish emerging from established policy fields.

In the following, the evaluation of the policy design research focuses on concepts and literature on individual policies and their combination ("policy mix"). The concept of the policy field is important for the identification of transfer potentials to climate adaptation policy.

Policy design research encompasses a variety of terms and concepts. There are also overlaps with related research areas (e.g. governance and strategy research). Policy design researchers strive to develop an increasingly complex and, at the same time, coherent set of terms and individual concepts and empirical findings, taking these related research directions into account (e.g. Howlett 2019a and Howlett and Mukherjee 2018c).

Nevertheless, an orientation towards the instruments or "tools" of the state is still characteristic for the consideration of policy design research (Howlett 2019a). Expressions such as "instrument", "tool", "implementation tool", "mean", etc. are often used as synonyms. However, as already mentioned above, the emphasis on the combination of instruments and measures has developed into a more complex understanding of the policy mix, in which possibilities for combining individual policies at the various spatial-institutional levels of politics ("multi-level policy ") are in focus, in particular.

The following lays the foundations for this understanding of policy mix and culminates in a complex typology of portfolio designs. To this end, the components of a policy mix will first be discussed with the necessary brevity. It is then necessary to explain the taxonomy of instruments of state action that is customary in policy design research, since this is terminologically somewhat different than taxonomies that are already in use in climate adaptation policy (cf. e.g. Blobel et al. 2016, Vetter et al. 2017, Hetz et al. 2019).

2.2.1.2 Components of a policy mix

Policies are based on a consistent means-ends logic and are made up of complex ends and means statements. Table 5 shows a systematic approach to the ends and means of policies that is often used in policy design research. A distinction is made between two dimensions: (1) ends and means, which (2) can find expression at different levels of abstraction. According to this, policies are not only and not primarily determined by statements about "measures" (in the sense of Knill and Tosun 2015), *but through the combination of ends and means statements on different levels of*

[9] In the sense of the actor perspective presented above (cf. Section 2.1.1.1) this chapter is based on a *micro*-scale approach. A meso- or macro-scale approach, on the other hand, would primarily include institutional framework conditions and mechanisms of interaction, communication and coordination *between* actors, in addition to their perceptions, interests, goals and instruments, and address climate adaptation policy on the whole as a policy field.

abstraction. However, whether a policy has already reached the stage where statements can be formulated at all levels of abstraction is an empirical question.

Table 5: The components of policy mixes

Policy content	High level abstraction (policy level)	Operationalisation (programme level)	On-the-ground specification (measures level)
Policy ends or aims	*Policy goals:* What general types of ideas govern policy development?	*Program objectives:* What does policy formally aim to address?	*Operational settings:* What are the specific on-the-ground requirements of policy?
Policy means or tools	*Instrument logic:* What general norms guide implementation preferences?	*Program mechanisms:* What specific types of instruments are utilised?	*Tool calibrations:* What are the specific ways in which the instrument is used?

Source: Howlett and Mukherjee 2018a; p. 7 (with format changes and slightly abridged).

Taxonomy of policy instruments

Table 5 on the components of a policy mix only lists the elements of such a mix, not how such a mix is systematically characterised (cf. the typology of portfolio designs below, in which a systematic distinction is made between a mix of instruments and a policy mix). The differentiation according to ends and means on the one hand and levels of abstraction of relevant statements on the other hand is still very rough. Policy research and the design-oriented work based on it have developed a differentiated understanding of the state "toolbox", which combines the requirement for differentiation to capture a complex reality of state action in (late) modern societies with the requirement for simplification and abstraction for scientific generalisations. The starting point is the widespread "NATO taxonomy" for the instruments of government action (see Table 6).

Table 6: Policy taxonomy according to management principles

	Nodality (N)	Authority (A)	Treasure (T)	Organisation (O)
Resource	Information	Law	Money	State structures and services
Management	Indirect Stimulation Provision of public goods by the addressees	Direct prescribing Provision of public goods by the addressees	Indirectly through financial incentives Provision of public goods by the addressees	Provision of public goods by the state

Instruments	Information campaigns, education, persuasion	Decrees, prohibitions, approval requirements, limit values	Taxes, fees, subsidies	State enterprises

Source: Knill and Tosun 2015; p. 37 (with minor changes, cuts and additions).

The central characteristic of this taxonomy is that it applies *resources of state action* to address the instrumental potential for effective policies. The expression "nodality" comes from network research and makes it clear that the state, through its position in political-administrative networks and its embedding in social processes, can use information, knowledge and persuasion as resources to indirectly stimulate the actions of policy addressees. To a greater extent, direct control interventions are possible through legally drafted requirements, prohibitions and other regulatory instruments. Financial resources available to state actors can be used to design financial incentives. Goals of state action are also to be achieved through the direct provision of public goods by organisations in the public sector (e.g. state-owned companies). *The NATO taxonomy is largely consistent with the distinction between the informational, regulatory and economic instruments mentioned above. For this reason, this report treats both terminologies as synonymous.*

Differentiating taxonomies can be found in the literature following this NATO taxonomy (cf. e.g. Howlett 2019b). In policy research, the depth of focus of the analysis of instruments depends on the thematic focus and goals of an investigation. An analysis aimed at comparing the effectiveness of different economic instruments (e.g. Michaelis 1996) requires a different differentiation of instruments than an analysis that offers an overview of the change in environmental policy instruments (e.g. Böcher and Töller 2012, Blum and Schubert 2018). Of fundamental importance, however, is the fact that policy design research now distinguishes between substantial instruments on the one hand and procedural instruments on the other (cf. Table 7).

Table 7: A simplified taxonomy of substantive and procedural implementation tools

Governing resource / *Purpose*	**Information**	**Authority**	**Treasure**	**Organisation**
Substantive	Public information campaigns	Independent regulatory agencies	Subsidies and grants	Public enterprises
Procedural	Official secrets acts	Administrative advisory committees	Interest-group funding	Government reorganisation

Source: Howlett 2019a; p. 150 (with minor changes).

Table 7 focusses primarily on the resources of state action (Howlett 2019a only replaces the term "nodality" with "information"). However, Table 7 emphasises the increasing importance of the procedural goals of state action. This action does not always aim at the provision of public goods by the state itself or through direct or indirect stimulation of the actions of policy addressees. State actors also use their resources to achieve process-related goals.

For example, the establishment of the Network of Authorities for Climate Change and Adaptation can be traced back to the formulation and implementation of procedural goals. Policy design research in this way emphasises that effective policies depend both on the chosen designs and on intentionally implemented design processes ("designing" or "design-as-verb", Howlett 2019a).

Coherence of goals and consistency of instruments

The previous explanations outline the status of policy design research on individual instruments at a glance. Analyses of individual instruments continue to have a certain place in research, especially when it comes to new instruments.[10] However, both conceptually and empirically, policy design research emphasises the importance and prevalence of combinations of instruments and measures (e.g. voluntary internal agreements within a regulatory framework, a combination that shows similarities with the concept of "cooperation in the shadow of hierarchy", cf. below).

However, the combination of instruments and measures also raises specific questions regarding the analysis and evaluation of the effectiveness of such complex interventions. Policy design research has primarily developed two specific evaluation criteria: coherence of policy goals and consistency of combined instruments. Using the two criteria of coherence and consistency, we can refine the term "integration" conceptually in the context of policy design research (cf. Table 8).

[10] See for example Howlett and Mukherjee (2018c), including e.g. Longo (2018) on "Digital Tools for Rapid Policy Design" with a focus on the development of prototypes as a characteristic of design in a general sense.

Table 8: Typology of policy mixes according to their relationship with existing policies

Instrument mixes are: / *Multiple goals are:*	**Consistent**	**Inconsistent**
Coherent	Integration	Drift
Incoherent	Conversion	Layering

Source: Howlett and Rayner 2007; p. 8 (with minor changes).

The criterion of coherence implies logically less strict requirements for the assessment of the relationship between goals than the criterion of consistency. A coherent system of goals as a necessary condition for an effective mix of instruments means first and foremost that a plausible, parallel relationship can be established between several goals. Even if no obviously contradictory goals are being pursued, it is nevertheless possible that government action is pursuing relatively unconnected – and therefore incoherent – goals. The criterion of consistency, on the other hand, is to be understood as a relation between two elements in a *logical* sense. Since instruments are used to specify state action and are intended to show how certain goals can be achieved in concrete terms, it is plausible to assume that the criterion of consistency is primarily applicable to instrumental components of policies.

If you combine the two criteria of coherence of several goals and consistency of several instruments, you get the typical four field matrix often found in policy design research (see Table 8):

- If the goals are coherent and the instruments consistent, it is possible to speak of an integrated policy.
- However, state action may be justified with new target statements due to changed social requirements without changing the instruments themselves. If these new goal statements only fit incoherently into an existing integrated set of goals and means, Howlett and Rayner (2007) consider this to be a policy conversion.
- It is also conceivable that, due to political activism, existing coherent goals remain unchanged while new instrumental elements are inconsistently inserted into an integrated set. State instrumental action "drifts" into a gap between coherent goals and inconsistent combinations of instruments.
- However, policy design research often describes problems of practical politics with the concept of "layering" (Howlett 2019a, Howlett and Mukherjee 2018b). Both new goals and new instruments are simply applied to existing arrangements in an incoherent and inconsistent way, forming another "policy layer". Layering processes therefore contradicts what policy design research associates with the concept of "design" to a particularly high degree.

2.2.1.3 Mix types typology: Instrument mix and policy mix

Policy design research uses the term *policy mix* primarily to describe a mix of several policies. *In this way, Policy A, consisting of several individual components, is intentionally linked to at least one*

other Policy B. Policy design research also takes into account that policies in (late) modern political systems can affect a large number of relatively independent state actors at several spatial and institutional levels (e.g. in federal states). In addition to several p olicies ("multi-policy"), multiple spatial-institutional levels must therefore also be observed ("multi-level"). Variances in a policy mix also result from the complex target systems ("multi-goal") that are possible in individual policies. Using these three points of comparison, policy design research has developed a typology of eight mix types (cf. Table 9).

Table 9: Basic typology of portfolio designs

Type	Multi-level?	Multi-policy?	Multi-goal?
Type I: Simple Single-level Instrument Mix			
Type II: Complex Single-level Instrument Mix			X
Type III: Simple Single-level Policy Mix		X	
Type IV: Complex Single-level Policy Mix		X	X
Type V: Simple Multi-level Instrument Mix	X		
Type VI: Complex Multi-level Instrument Mix	X		X
Type VII: Simple Multi-level Policy Mix	X	X	
Type VIII: Complex Multi-level Policy Mix	X	X	X

Source: Howlett 2019a; p. 160 (with format changes), cf. also Rio and Howlett 2013; p. 7.

The typology of eight mix types is a complex heuristic concept to reduce the diversity of real policies down to a manageable set of types. In detail, the following should be mentioned:

- All mix types are assumed to imply a mix of instruments and measures. Differences in the designation of types as instrument mix or policy mix result from whether there are several policies (policy mix) or not (instrument mix). The typology illustrates the shift in focus in policy design research *from questions of combining instruments to questions of combining policies.* This shift in focus is likely to be of particular importance for cross-cutting policies such as climate adaptation (cf. The Federal Government 2020).
- The concrete understanding of "multi-level" remains empirically undefined in the typology. In federal states, it makes sense to differentiate between spatial and institutional levels. However, this specification is not mandatory. The distinction between a horizontal and a vertical dimension for the understanding of portfolios in policy design therefore requires a specific empirical step.
- As a heuristic concept, the typology is *descriptive* and not meant to be explanatory or evaluative. Why state actors implement a certain type of mix and how its effectiveness is to be analysed and evaluated are further tasks of the analysis. However, policy design researchers emphasise their view that the complexity of the mix types has tended to have received too little attention up to now. This could be interpreted as a certain type of design flaw.

First indications for using the typology of mix types are also the working hypotheses on the distribution of the types formulated by Rio and Howlett (2013). Rio and Howlett (2013) argue

on the basis of plausibility (see Table 10) that four types are rare (Types I, III, V, VII) and that four types are to be understood as frequent (Types II, IV, VI, VIII).

Table 10: Frequency of mix types

Frequent	Less Frequent or Rare
► **Compound Tinbergen Instrument Mix** (Type II: Complex Single-level Instrument Mix) ► **Classic Policy Mix** (Type IV: Complex Single-level Policy Mix) ► **Standard Intergovernmental Policy Mix** (Type VI: Complex Multi-level Instrument Mix) ► **Complex Intergovernmental Policy Mix or Strategy** (Type VIII: Complex Multi-level Policy Mix)	► Simple Tinbergen Instrument Mix (Type I: Simple Single-level Instrument Mix ► Type III: Simple Single-level Policy Mix ► Type V: Simple Multi-level Instrument Mix ► Type VII: Simple Multi-level Policy Mix

Source: Rio and Howlett 2013; p. 8 (with format changes and an addition to the title).

The four mix types that are likely most common according to Rio and Howlett (2013) are explained in more detail below. The focus is not on the formal type designations, but on the catchier designations that can be linked to research by third parties:

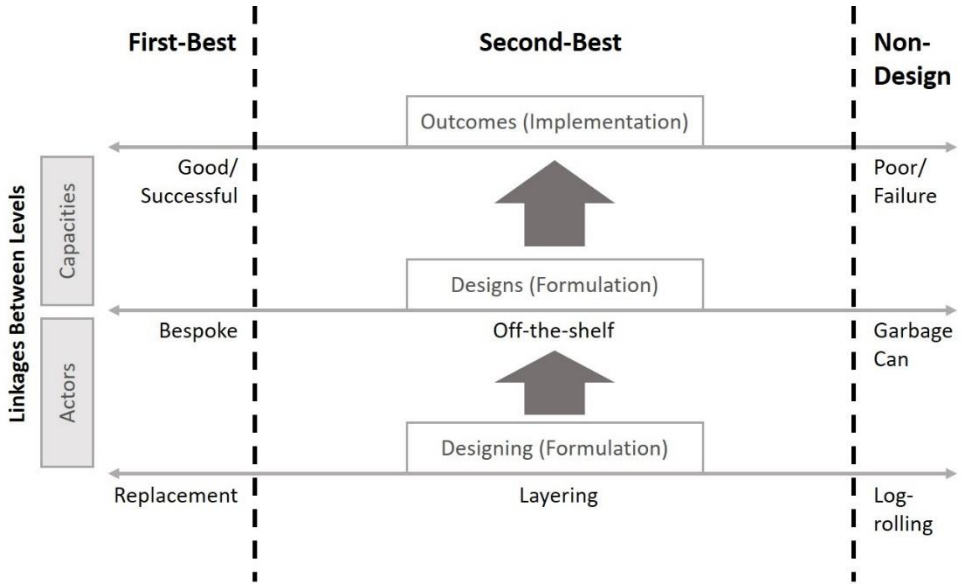
- *Compound Tinbergen Instrument Mix (Type II):* The starting point here is the "Tinbergen rule" that an individual policy goal should be achieved with just one single control instrument (in the sense of a 1:1 relationship between end and means). In view of the diversity of political values and objectives, a variety of objectives can therefore be assumed for a mix of instruments.
- *Classic Policy Mix (Type IV):* As with the previous type, policy design occurs at a single "political level" which greatly reduces the complexity of the requirements compared to Type VIII. Put simply, this type is "integrated politics", for example at federal level. The use of the term "classic" indicates that policy mixes with this orientation have long been a topic in political science and governance research (cf. e.g. Lang and Tosun 2014, Bevir 2012 for an overview of the variety of approaches).
- *Standard Intergovernmental Policy Mix (Type VI):* The use of the term "policy mix" here is actually a bit problematic because it is a mix of instruments, without a combination of policies. The term "standard" is also intended to signal wide distribution. In a German context, it makes sense, for example, to refer to the "cross-federal levels of professional fraternities" as an example. With this type of policy, multi-level policy goes hand in hand with a rejection of cross-sectional policy.
- *Complex Intergovernmental Policy Mix or Strategy (Type VIII):* This type places the highest demands on the integration of policies and spatial-institutional levels. State actors attempt to implement cross-sectional policies with a complex set of objectives across multiple levels. The addition "...or strategy" is probably intended to make it clear that this requires strategic action to a particular extent.

The typology is the focus of the starting points for the transfer of policy design research to the policy field of climate adaptation. Of particular importance are the three types IV, VI and VIII. A complex, cross-level strategy in the sense of Type VIII can be understood as a kind of frame of reference (or "maximum programme") for integrative strategies. Under certain framework conditions, however, it is also conceivable that policy design efforts seek to achieve the suspected "deeper fruits" of the two policy mix types IV and VI.

2.2.1.4 Design processes, designs and their implementation: Three levels of effectiveness

The expression "policy mix" has been systematically defined with the previous explanations. Questions of the effectiveness of a policy mix are also considered in policy design research in a differentiated manner (see Figure 2). Figure 2 clarifies two main statements: (1) effectiveness analyses are required for design processes as well as the resulting designs and outcomes; (2) the simple comparison of first-best designs and non-designs is of little help – interim solutions in the sense of second-best designs should also be considered. Policy design research is still influenced to a large extent by means-ends logic, but seeks to realistically adapt it to different political processes and contexts by differentiating its concepts of effectiveness analysis.

Figure 2: First-Best and Second-Best Policy Design



Source: Mukherjee and Howlett 2018; p. 381.

As briefly mentioned above, the emphasis on the content dimension of politics in policy design research should not lead to the assumption that processes and institutional framework conditions play no role here. Policy and policy design research often understands political processes and institutions as "that which explains" specific policies ("that which is to be explained") (cf. Blum and Schubert 2018, Knill and Tosun 2015). Policy design research has dealt intensively with the question of how design-oriented policy processes are to be differentiated and distinguished from non-design processes (summary Howlett 2019a as well as Howlett and Mukherjee 2018b).

However, the terminology of policy design research on procedural policy options is still inconsistent and in flux. This is shown, for example, in the fact that different publications contain different understandings of "layering", i.e. the "superimposition" of political goals and instruments. Howlett and Rayner (2007; p. 8) describe "layering" as a process of adding goals and instruments to existing policies, resulting in incoherent goals and inconsistent combinations of instruments (see Table 8 above). Mukherjee and Howlett (2018; p. 381), on the other hand, understand "layering" as the second-best solution, which distinguishes them from non-design processes (see Figure 2 above).

Against this background, this report uses policy design research to describe two second-best policy designs in a comparative manner (cf. Table 11).

Table 11: Reform packages and intelligent patchwork as the second-best policy designs in comparison

	Packaging	Smart patching
Contents	Package with reform statements on all components of a policy	Focus on selected components at programme and implementation level
Processes	Reform package in response to a widely perceived need for reform	Reform initiative to adaptively achieve intelligently placed improvements

Source: adelphi (with restrictions based on Howlett and Mukherjee 2018b; p. 310).

"Packaging" as a reform in the sense of formulating and implementing an entire reform package demonstrates a higher demand for design quality by addressing the complete set of components of a policy (see Table 5). The processes leading to the political acceptance of a need for reform and related reform packages can vary, e.g. processes in the sense of a "broken equilibrium", where incremental processes precede abrupt episodes of change and then follow them again – within the framework of a new "regime" (cf. transition research below). Successful reforms through package solutions also depend on exploiting windows of opportunity.

Smart patching, on the other hand, is more selective in terms of content and focuses on policy components at the programme and implementation level (see Table 5 above). Political processes are characterised by adaptation, i.e. by iterative repetitions and partial specifications of content depending on dynamic context conditions. It is crucial that the focused reform project gradually gains in technical and professional quality and political support (cf. Table 4 on "capable design" as a sign of an effective policy).

In policy design research, the concept of the intentional design of policies clearly plays a major role ("human agency", Emirbayer and Mische 1998). However, policy design research also warns

against overestimating the possibilities for the innovative redesign of policies, and not just because of a lack of technical knowledge about problems and their solutions (cf. Howlett 2019a on various forms of uncertainty in the formulation, implementation, etc. of policies), but also due to institutionally anchored behavioural tendencies in the public sector to avoid possible blame for reform projects ("blame avoidance") than to ascribe the improvements envisaged by such projects to allow ("credit claiming"). To paraphrase Howlett:

"The literature on policy dynamics suggests that adopting a 'courageous' policy initiative with a large downside possibility of failure and adverse consequences in terms of electoral fortunes, reputation or legitimacy is not a prospect likely to appeal to many policy-makers who require these status-enhancing characteristics in order to remain, or remain effective, in their present (and future) positions…." (Howlett 2014; p. 398)

Policy design research therefore proposes to systematically relate two dimensions in the institutional context of tendencies to avoid assigning blame in political processes: (1) the dimension of the scope of a policy problem; and (2) the dimension of public visibility (see Table 12).

Table 12: The contextual dimension of blame avoidance: Aspects of the severity of a policy problem and the need for government response

Scope / *Visibility*	**High**	**Low**
High	Requires concrete ameliorative action including shifts in overall policy goals and instrument preferences (e.g. high levels of automobile accidents requiring safety regulations and changes in manufacturing technologies and attitudes)	Requires short-term or symbolic action including innovations in policy objectives and tools (e.g. dangerous dog attacks requiring new bans of specific breeds or new regulations of kennels)
Low	Requires some long-term attention including innovations in some aspects of policy objects and tools (e.g. poverty initiatives such as those involving different efforts to house inner-city homeless)	Does not require action or requires continuous low-level actions linked to instruments settings and targets (e.g. petty crime prevention requiring additional police to target, for example, an increase in pickpocketing activity)

Source: Howlett 2014; p. 398 (with minor format changes).

2.2.2 Starting points for the transfer to the policy field of climate adaptation

Policy design research is appealing above all due to its systematic development of a complex typology of types of a policy mix (see Table 9 above). Previous UBA projects on DAS action planning have either completely ignored this typology (e.g. Blobel et al. 2016) or only partially taken it into account (e.g. Hetz et al. 2019). Blobel et al. (2016) focus in the publication on the "Proposal for a Policy Mix for the Climate Change Adaptation Action Plan" on the combination of control instruments and measures of climate change adaptation. *The fact that the expression "policy mix", according to policy design research, actually requires the combination of at least two "policies" was not considered.* Hetz et al. (2019) go into more detail about the diverse options for

designing a policy mix, but do not systematically differentiate between the mix of instruments and the policy mix (cf. Table 13).

Table 13: Distinction between instrument mix and policy mix

Dimension	Instrument mix	Policy mix
Policy	Focus on combination of instruments and measures to achieve one or more goals	Focus on cross-sectoral policy by combining goals and instruments of several "policies"
Politics	High level of teleological ambition	Context-related steering ambition
Political institutions ("polity")	Institutional conditions for the use of multiple steering resources of state action (e.g. legal regulations and public finances)	Institutional conditions of the horizontal and vertical integration of policies

Source: adelphi.

A mix of instruments is characteristically formulated in the framework of a single "policy" – even if there are several goals. In the case of a single objective for the use of instruments and measures in particular, a high level of teleological ambition is plausible, which means that several instruments, in combination, also "demonstrably" contribute to the effective realisation of the objective. The degree of complexity of a mix of instruments is probably often significantly lower than that of a mix of "policies".

A policy mix expresses the need to integrate several "policies", each of which can contain complex statements of goals and means on different levels of abstraction (cf. Table 5 on the components of a "policy"). Policy design research is quite "realistic" in that the combination of complete policies at all levels of abstraction is not expected in every case. The actors involved in politics and administration may only be able to agree on the programme and implementation level, while there are divergences in the abstract justification of target and resource statements (so-called "smart patching", see above). However, it is also conceivable that only abstract justifications and statements of objectives are capable of consensus, while agreement at the implementation level is not to be expected. In the case of a policy mix, the contextualisation of the steering ambition is particularly obvious.

The transfer of the policy mix typology from policy design research in this way represents an innovation for the further development of the DAS. In principle, this is neither just an incremental improvement nor a radical change to the DAS. The innovation lies in a *more comprehensive and systematic understanding of the type of policy mix that can achieve the goals, instruments and measures of climate adaptation*. Using the policy mix typology of policy design research enables the classification of "policies" within the framework of the DAS, which facilitates the more deliberate design of strategy development for political instruments. The innovation, then, lies *between* incremental and radical innovation and applies more to the "framing" of the goals, instruments and measures of climate adaptation.

As an interim conclusion, we would in general argue *for the use of the policy mix typology of policy design research*. With its eight types and other concepts of policy design research (e.g.

"packaging" and "smart patching"), this typology can be applied flexibly to goals, instruments and measures within the framework of the DAS. Innovations in the use of the policy mix typology in the context of the DAS presumably differ significantly, depending on whether they are intended to serve the internal improvement of the network of authorities or whether they aim at a more "overall" change in the DAS and affect the context conditions of the network of authorities (cf. Table 1 above for the systematic content of the literature analysis).

2.2.2.1 Improvement of the procedure for political instruments in the network of authorities

As mentioned above, the network of authorities was set up in 2017 as a group of federal agencies and institutions in order to support the IMAA in implementing the DAS (cf. The Federal Government 2020; p. 31). The network receives direction from the UBA; in 2020, it represented 28 federal agencies and institutions. The network has increasingly dealt with issues relating to the development of a policy mix for climate adaptation. However, it did not address the policy mix typology of policy design research in a comprehensive, systemic manner (cf. Hetz et al. 2019). To summarise and (simplify the matter somewhat): Questions of the combination of "policies" have, as of yet, primarily been questions of the combination of policy *instruments*. The network has therefore dealt with combinations of instruments and less with the systematic linking of "policies". Interdependencies between the goals and instruments of different "policies" were reflected in the selection of criteria for the analysis and evaluation of instruments (the criteria of effectiveness, flexibility, efficiency, coherence, synergy potential, cf. Hetz et al. 2019). The application of the criteria to selected action fields of climate adaptation led in particular to statements on individual instruments and only to a supplementary and rudimentary consideration of instrument combinations in the action fields.

Against this background, we suspect that there is potential for the transfer of policy design research (especially in the systematic application of the policy mix typology) to the design of the procedure for the analysis and evaluation of political instruments. Such a transfer would be reflected above all in the innovative improvement of the procedure in the form of a changing criteria for the evaluation of policy instruments:

- *Analysis and evaluation of individual instruments:* The previous procedure for supporting the DAS action plan has proven its worth, especially with regard to individual instruments. Through the development and testing of the process, a lot of experiential information for the concrete implementation of the process and tips for process improvement could be collected (cf. summarising Hetz et al. 2019). Such improvements relate, for example, to the understanding between the NWPs about the tasks and roles of the individual partners and the network as a whole, the understanding and concrete application of the five criteria on policy instruments and numerous details on the more "technical" implementation of the process.
- *Analysis and evaluation of instrument combinations:* However, questions of a mix of instruments in the action fields of climate adaptation have not been not the focus of the procedure up to this point. In the course of the analysis and evaluation of individual instruments, (1) information on overarching policy instruments was collected (e.g. basic climate services) and, (2) *after* the valuation of individual instruments, only *supplementary* evaluations for the combination of instrumental statements were developed. The use of policy design research to improve the process would lead to significant process changes in the more intensive and more systematic analysis and evaluation of combinations of instruments. This would affect, for example, the type of target formulation for the

application of the effectiveness criterion as well as the assessment of interdependencies between several instruments. This makes it easier to evaluate the effectiveness of combinations of instruments by formulating objectives that are as specific and clear as possible. This suggests combinations of instruments based on effectiveness, *as much as possible with only one goal*, and not an evaluation based on multiple goals. The set of evaluation criteria would also have to be expanded to include the criterion of consistency with regard to several instruments (cf. Table 8 above). *Within the framework of the procedure, a clear distinction should be made between the coherence of goals and the consistency of instruments.* Overall, it can be seen that the systematic consideration of policy design research with regard to combinations of instruments should lead to significant, if not radical, changes in the procedure for the network of authorities.

- *Analysis and evaluation of types of a policy mix:* Of the policy mix types, two are presumably of particular importance for the DAS (see Table 10 above): the "classic policy mix" (Type IV: several policies, goals and *one* level of strategy development) and the "complex cross-level policy mix" (Type VIII: multiple levels, goals and "policies"). However, policy design research argues that the complex strategy for multiple policies and levels faces particularly high challenges when it comes to effective implementation. This raises the question of how *ambitious* the selection process for the claim of cross-sectional orientation is (cf. Vetter et al. 2017), particularly for cross-departmental and spatial-institutional strategies. Compared to the analysis and evaluation of combinations of instruments, the improvement of the procedure for policy instruments in the network of authorities as a policy mix is even more ambitious. There are numerous reasons for this, one of which is highlighted below: Contributions by the network of authorities to the realisation of a policy mix already require the development of a coherent system of objectives across at least two "policies" in the case of Type IV. Questions about the consistency of instruments can only be answered systematically after analysing a complex set of more or less specific target statements (cf. Hetz et al. 2019). Contributions by the network to combinations of instruments as part of a policy mix therefore require greater differentiation in the analysis of policies, goals and policy instruments. The previous procedure would have to be revised to a great extent – if not radically – for such an evaluation task.

2.2.2.2 Starting points when designing the network context within the DAS

The DAS is a complex strategy process, horizontally and vertically:

- Horizontally, this complexity results from the large number and variety of action fields for climate adaptation, as outlined in the central strategy document from 2008 (The Federal Government 2008). In contrast to the term "policy", the expression "action field" has fewer prerequisites. A policy requires the existence of goals and means statements on several levels of abstraction (see Table 5 above). The expression "action field", on the other hand, focuses on instruments and measures – without the need for naming abstract *and* concrete goals. With the political priorities formulated in the second progress report (cf. The Federal Government 2020; p. 52) on the development of measurable targets for climate adaptation and the emphasis on effectiveness analyses of instruments and measures, the orientation towards "policies" within the framework of the DAS is becoming increasingly important.
- Vertically, the high complexity of the DAS strategy process results from the different spatial-institutional levels of the DAS and the key players at these levels (see Figure 1 above).

A high level of complexity also results from the fact that the historical and factual-spatial conditions of climate adaptation can take different forms and interact in a variety of ways, depending on the action field and specific political-administrative problem. For example, there is already plenty of experiential information on strategies for river floods at the municipal level as well as at the federal and state levels – not least as a reaction to the flooding of the Elbe and its tributaries in August 2002. In comparison, the hot summer of 2003 triggered fewer reform activities. However, taking precautions against heat stress in urban areas and dealing with heat waves has gained in importance in recent years based on experience with recurring hot summers. The disaster in the Ahr valley due to a heavy rain event in 2021 clearly demonstrated the need for intensified strategy development to reduce the risk of heavy rain. For the reduction of river and heavy rain risks, the consideration of factual and spatial differences between these two types of environmental risks is of great importance (e.g. typical river flood risks as medium to long-term prospective factual and spatial risks that can be more clearly defined compared to heavy rain risks, which can happen anywhere, in principle).

Policy design research has developed an understanding of the policy mix that corresponds precisely to this high level of complexity (see Table 9 above). For the DAS as a whole, it should therefore be assumed that policy design research provides the basis for proportional policy design in climate adaptation policy in practice (cf. Table 3). How these principles are used depends in particular on the specific goals for the further development of the DAS. Here, too, it makes sense to differentiate the transfer potential of policy design research according to individual instruments on the one hand and the mix of instruments and policy mix on the other:

- *Improvement of individual instruments for climate adaptation:* The policy field of climate adaptation has established itself with regard to specific problems, actors and institutions (cf. Stecker 2015, Vetter et al. 2017). The specific instrumental character of climate adaptation policy is less pronounced, because climate adaptation is important for a large number of informational, regulatory and economic instruments (cf. Vetter et al. 2017). The DAS as a strategy process for climate adaptation was officially established in 2008 with the argument that climate adaptation should lead to changes in numerous action fields in politics and administration. The cross-sectional orientation of the DAS is in a tense relationship with the

characteristics of the specialisation of policy areas, because the latter is underlined by policy instruments that are publicly *visible* and can be *exclusively* assigned to a policy field (e.g. dyke construction or the construction of flood walls as special measures of structural flood protection in cities and regions as a component of integrated flood risk management). It would make sense, then, to examine whether the concepts of policy design research can also be consulted with regard to improvements in the individual instruments for the "particularity" of the policy field of climate adaptation (cf. Howlett 2019a, Howlett and Mukherjee 2018c). It would also be conceivable that priority-setting in the development of measurable adaptation goals is particularly suitable for profiling climate adaptation policy (profiling = formulation of an exclusive steering ambition).

- *Improvement of instrument combinations and options for a policy mix:* Combinations of instruments and policy mix each have specific strengths. The simpler, in some cases clearer goal orientation, which benefits the learning processes in the context of the DAS, is a favourable element of an instrument mix. Ideally, a demonstrably effective bundle of instruments is "derived" from an ambitious goal and, if contextually plausible, presented as a reform package for climate adaptation. A policy mix, on the other hand, requires coherent objectives across several policies and therefore promises "gains in integration", but may fail due to the realities of a highly differentiated political-administrative system in late modern societies that can only be integrated to a limited extent.

Overall, it is clear that the concepts of policy design research *in combination* should be included in the further development of the DAS. Only an orientation towards individual instruments, combinations of instruments and options for a policy mix allows the required policy design flexibility for effective climate adaptation policy.

2.3 Governance Research

2.3.1 Coordination of the variety of actors

Governance concepts have also found their way into policy design research (cf. Howlett 2019a, Howlett and Mukherjee 2018c). Nevertheless, the consideration of governance, which is specific to policy design research, is *not* the primary focus here. This is because policy design researchers (such as Howlett 2019a; p. 31) represent a very broad understanding of governance analysis that includes legal, corporate, market and network governance approaches. Governance researchers such as Klijn and Koppenjan (2016) criticise such an understanding of governance as *to wide* and *diffuse*. The specific challenges of governance to coordinate actors with their different perceptions, interests, preferences and strategies could not be adequately considered in this way. In addition, it would encourage an inflationary use of the term "governance" (cf. Klijn and Koppenjan 2016; p. 6ff. on four misunderstandings about what governance is).

Against this background, the following begins by explaining a narrow understanding of governance that focuses on network governance. A problem analysis then takes place in the sense of identifying four sources for "errors" or weaknesses in the execution of policies (Ansell et al. 2017a). The further explanations show which options exist to avoid such weak points and to learn from mistakes. The section provides an overview of *selected* concepts (network management and "collaborative governance" as well as multi-level governance and metagovernance).

Narrow understanding of governance: Governance as a network-based form of coordination

Numerous academic disciplines work on governance. The term "governance" therefore requires specific explanation. For a narrow understanding of governance, we must distinguish two levels analysis and argumentation (cf. e.g. Bevir 2012, Hutter and Thaler 2018, Wiechmann 2019):

- On an *empirical level*: i.e. specific forms of coordination that are characterised by non-hierarchical and non-market relationships (e.g. inter-organisational networks, forms of self-regulation, Klijn and Koppenjan 2016).
- On a *normative-practical* level, questions of "good governance" arise. Concepts, criteria and indicators are sought in order to achieve socially desirable effects (e.g. combating corruption).

This report uses an empirical understanding of governance.[11] This is a first step towards a conceptual approach to governance. Further steps are necessary because – as overviews of governance concepts show (e.g. Bevir 2008, Ansell and Torfing 2016) – even an empirical understanding of governance shows a wide variety of possible forms (e.g. collaborative governance, multi-level governance, global governance, metagovernance).

On an empirical level, governance as a specific form of coordination can be conceptualised in different ways. The following provides four guidelines (cf. e.g. Grande 2012, Ansell and Torfing 2014, Klijn and Koppenjan 2016):

- *Differentiation and complexity:* Forms of governance develop in the context of the increasing internal differentiation and complexity of the political-administrative system and social processes (e.g. increasing complexity of the constellations of actors and of policies, political-administrative processes and institutional regulations).
- *Diversity of interdependencies:* Forms of governance are intended (and can also be used when certain conditions and processes exist) to deal with interdependencies (e.g. territorial interdependencies, interdependencies between resources and "policies" and between social sub-areas such as politics, business, science, education, etc.).
- *Cooperative state and networks:* Governance is a non-hierarchical and network-based form of coordination for dealing with interdependence for the production of public goods, especially through cooperation. Governance researchers emphasise the importance of networking, cooperation and negotiation between state and non-state actors (cf. e.g. the much-cited model of "collaborative governance" by Ansell and Gash 2008, cf. also Grande 2012).
- *Innovation and complex value relationships:* Governance is faced with increasing expectations to develop innovative solutions to problems. Expectations of governance are fundamentally based on a complex set of value references and evaluation criteria, which in liberal[12]-democratic states include democratic legitimacy, rule of law, accountability, effectiveness, innovation.

The understanding of governance used here is therefore narrower than governance in policy design research with regard to the type of coordination of diverse actors. However, the number and heterogeneity of value references and evaluation criteria for the analysis and evaluation of

[11] The empirical understanding of governance in this report is already evident from its structure. This is because, in the case of a broad theoretical-conceptual understanding of governance, this would have to come *before* the literature review of policy design research.

[12] In recent years, the so-called "illiberal democracies" have increasingly been distinguished from liberal-democratic states (Krastev und Holmes 2019).

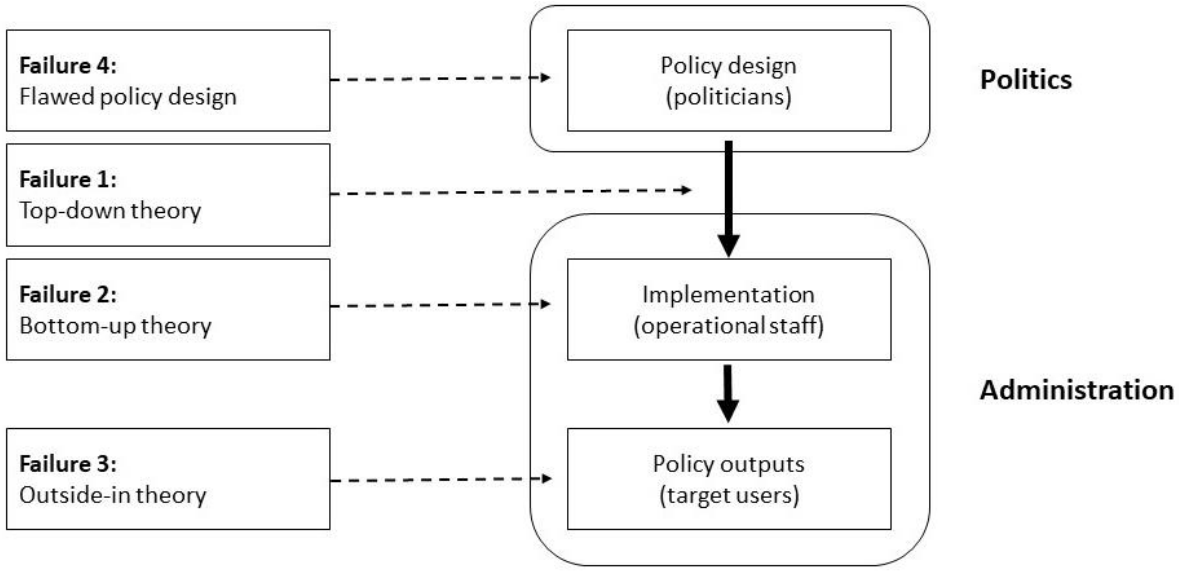
the performance of governance is higher than that of effectiveness-oriented policy design research (Klijn and Koppenjan 2016).

Four sources of policy execution weaknesses and errors

It's easy to get lost in the "governance jungle" in two ways: (1) the inflationary use of the term "governance" (cf. above); and (2) the highly selective use of a single concept whose scope is unduly extended (e.g. analysis of a policy mix on several levels as "collaborative governance", cf. Ansell and Gash 2008 on "concept stretching", cf. e.g. Gerring 2012).

For orientation in the "governance jungle", we proceed as follows: (1) First, a simplified analysis of possible weaknesses and sources of error in policies (based on Ansell et al. 2017a); it is advantageous that Ansell et al. (2017a) seek to systematically link their analysis to policy design research (see Figure 3). They present selected governance concepts with regard to possible weaknesses and sources of error in "policies".

Figure 3: Four sources of policy execution failure



Source: Ansell et al. 2017a; p. 474.

Figure 3 illustrates the relationship between four sources of policy execution failures (Ansell et al. 2017a):

- *Failure 1* makes it clear that "policies" in modern societies have to cover long distances from policy design to implementation by the intended addressees ("target users"), where communication gaps, delays, veto positions, etc. are often likely ("top-down theory" in Figure 3).
- *Failure 2* reminds us that the productive interaction of actors "from above" and "from below" does not always succeed (e.g. because actors "on site" pass the desired success reports upwards in the chain of command, without addressing problems as opportunities for shared learning, bottom-up theory in Figure 3).
- *Failure 3* shows that state action is also limited to a large extent by the framework conditions of the target audience and the functioning of sub-areas of society (limits of state control *ability*, e.g. with regard to the achievement of concrete market results, "outside-in theory" in Figure 3).

- Ansell et al. (2017a) add a fourth to the three sources mentioned so far: *Failure 4* shows, in the sense of policy design research, that weaknesses and errors in the design cannot be compensated for even by avoiding failures 1 to 3. Ansell et al. (2017a) emphasise the role of political mandate holders. Mandate-holders are of great importance, for example, for the basic goals of policies ("policy goals", see Table 5) and the legitimacy of specific policies. However, they also point out (2017a; 479ff.) that mandate holders can neglect or even undermine effective policy design (e.g. when mandate holders are less interested in the policy content and instead focus on gaining a position and maintaining power; or when ideological orientations make compromises difficult; or when there are strong interdependencies with organised social interests).

Failure 4 was the subject of the remarks on policy design and is therefore not dealt with in detail below. The following focuses on four selected governance concepts that include options for failures 1 through 3.

2.3.1.1 Types of networks and network management

The avoidance of weak points and errors in the cases of failures 1 and 2 (see Figure 3) first requires an understanding of different network types and management approaches. Because governance as a network-based form of coordination of collective action is a diverse phenomenon in (late) modern societies. Klijn and Koppenjan (2016) distinguish three network types based on research from the political and administrative sciences as well as organisational research (see Table 14).

Table 14: Types of networks in empirical research and their characteristics

	Policy networks	Service delivery and implementation	Collaborative and network governance
Main origin	Political science	Organizational science / inter-organization theory	Public administration, collaborative planning, and argumentative policy analysis
Focus	Decision making and effects Closure and power relations on issue and agenda setting	Inter-organizational coordination Effective policy/service delivery Integrated policy/services	Solving societal problems by managing horizontal collaboration
Main fields and research questions	Which actors are involved in decision making? How are the power relations and what are the effects on decision making?	How can complex integrated services be coordinated? What mechanisms are effective and efficient (contracting, partnerships, etc.)?	How to manage governance networks? How to organise them and connect them to traditional institutions?

			How to improve variety of content and combine various value judgements?

Source: Klijn and Koppenjan 2016; p. 23 (Excerpt; the comments on the history of the analysis of network types and the key authors have been omitted.)

Political science articles have primarily dealt with policy networks. Concepts of power and limited access to policy networks ("closure") were in the foreground in order to analyse the effects of these networks on political processes. Organisational research, on the other hand, is more interested in the question of how network actors can manage interdependence effectively and efficiently, e.g. in the provision of public goods in the form of services for specific target groups. It focuses on implementation networks ("service delivery and implementation network"). Klijn and Koppenjan (2016) argue that, compared to these two network types, the third type of "collaborative and network governance" has gained in importance in theory and practice.

In an ideal scenario, the management of implementation networks tends to correspond to a traditional management approach, in which network partners with a variety of perceived problems, interests, preferences and strategies gradually *reduce* this variety down to a joint solution ("reducing plurality", see Table 15) to efficiently implement an integrated and effective provision of services. For the traditional approach to network management, the differing perceptions and preferences of actors are themselves a management problem that needs to be solved by reducing this diversity. Governance networks ("collaborative and network governance"), on the other hand, strive to *continuously* deal with diverse perceptions and preferences of network actors and see this as a central challenge for effective, innovative and democratic networks. Diversity of perceptions and preferences is not a management problem to be solved per se, but basically the purpose of developing and establishing networks between organisations and people. Through network formation and network management, diverse direct communication between network partners about political content should be made possible in the first place, without forcing them as early as possible into the "Procrustes bed" of an envisaged effective and efficient problem solution (see Table 15).

Table 15: Traditional and network approaches to managing substantive complexity

	Traditional approach	Network approach
Dealing with complexity about problems	Ex ante clarification of problem by information gathering and (scientific) research	Avoiding of early fixations; furthering awareness of plurality of perceptions and preferences
Dealing with solutions	Formulation of ex ante objectives and criteria for development and selection of optimal solution	Furthering substantive variety and favourable conditions for learning and intermediate adaptations
Reaction to plurality of perceptions and preferences	Reducing plurality by excluding perceptions or searching for an authoritative problem formulation	Joint image building: search for common grounds for joint interaction, recognizing enduring differences

Source: Klijn and Koppenjan 2016; p. 127 (with minor format changes).

Dealing with the diversity of content in networks in this way determines whether the network management is traditional or innovative. Efforts by network managers to reduce the diversity of content and establish a solution that is convincing ("authoritative") for everyone amount to acts of traditional management. Efforts by network managers to strengthen collective attention to the diversity of network content and continuously use it to work out solutions are still valid as an innovative management approach according to Klijn and Koppenjan (2016).

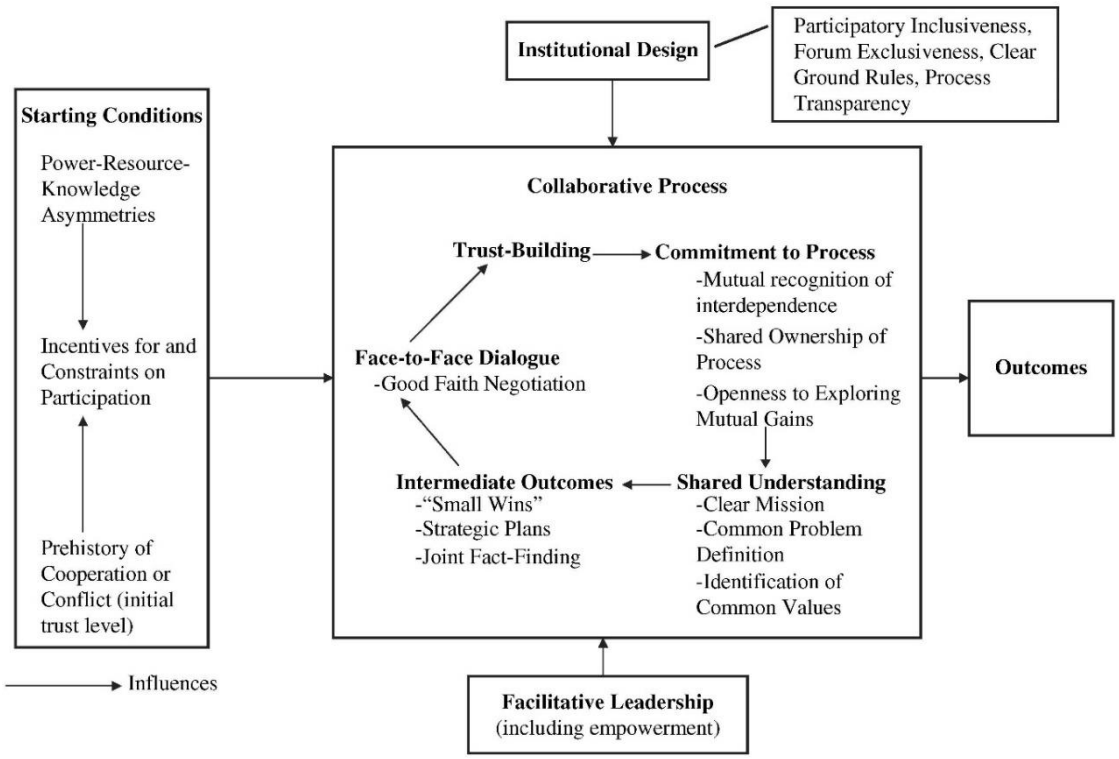
This contrast between traditional network management, especially with regard to implementation networks, on the one hand, and innovative management in the sense of network governance, on the other is to be understood as *ideal*. In actual network cases, mixes of network types and management approaches are likely to occur frequently, as Klijn and Koppenjan (2016; p. 37) themselves emphasise. In addition to the simplified classification of governance with regard to different network types and management approaches, a more empirically differentiated approach is therefore required, as is the case with the concept of "collaborative governance" from Ansell and Gash (2008).

2.3.1.2 Collaborative governance and other concepts

Like the innovative network management, the concept of collaborative governance primarily addresses sources 1 and 2 for weaknesses and errors in policies. Ansell and Gash (2008) define collaborative governance as a "governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programmes or assets." (Ansell and Gash 2008; 544)[13] Based on this definition and an extensive literature analysis, they develop a widely recognised conceptual governance model (see Figure 4).

[13] The definition from Ansell und Gash (2008) emphasises the interaction of state and non-state actors. The model from Ansell und Gash (2008) has, however, also been applied to the interaction of state actors alone (Ansell 2012). Because the model components are formulated in such a general way that they also apply to processes of *inter*-governmental action. The same applies to the propositions of the model.

Figure 4: A model of collaborative governance



Source: Ansell and Gash 2008; p. 550

The model consists of five main building blocks: starting conditions for governance, institutional design, leadership ("facilitative leadership"), collaborative process and results ("outcomes"). The first four building blocks are subdivided into individual elements, while the result of collaborative governance is not further differentiated. Numerous theoretical and empirical governance analyses have further developed this model or used it for empirical work (cf. e.g. Hutter 2016).

The model of collaborative governance *expands* on the policy design research, which is highly oriented towards content-related, ends-means questions, through a context- and process-related analysis of governance episodes. An episode is characterised by the possibility of specifically naming the beginning and end of a period (e.g. episode from 2008 to 2013, cf. Hutter and Bohnefeld (2013) on the strategy project REGKLAM for climate adaptation in the Dresden region; see also the "starting conditions" and "outcomes" in Figure 4). The model can be used to retrospectively and prospectively examine the initial conditions and the institutional design as well as questions of leadership and process design for realized and/or future cooperation.[14]

Multi-level governance

Tables 9 and 10 illustrate the great importance of vertical levels in policy design. However, what is to be understood by vertical levels remained empirically undetermined and was addressed, for example, by reference to spatial-institutional levels in the sense of policy development in states with a federalist structure.[15] Figure 3 on the identification of weaknesses and sources of

[14] Below is even more detail on the transfer potential of the model from Ansell und Gash (2008), applied to the policy field of climate adaptation.

[15] Multilevel analyses are widespread in social science research. For example, for in their review of innovation research, Garud et al. (2013; p. 778) distinguish between three levels: (1) individual companies, (2) network of companies, and (3) community of private

error in the execution of policies is also based on the simple distinction between three levels that can be derived from regulations and procedures of democratic legitimacy: The level of policy design, policy implementation and the level of the policy result in connection with the actions of the policy addressees.[16]

Tosun and Treib (2018) use their conceptual model (see Figure 5 below) to carry out an in-depth analysis of policy feedback processes with different implementation conditions.[17] They distinguish between two types of implementation structures: (1) centralised and (2) decentralised. The former is characterised by a low number of actors at implementation level; the latter by a large number of actors. In the case of centralised implementation structures, the relatively few actors also have little scope for adapting a policy design to the situation; with a decentralised structure, on the other hand, there is greater scope for adapting to the situation.

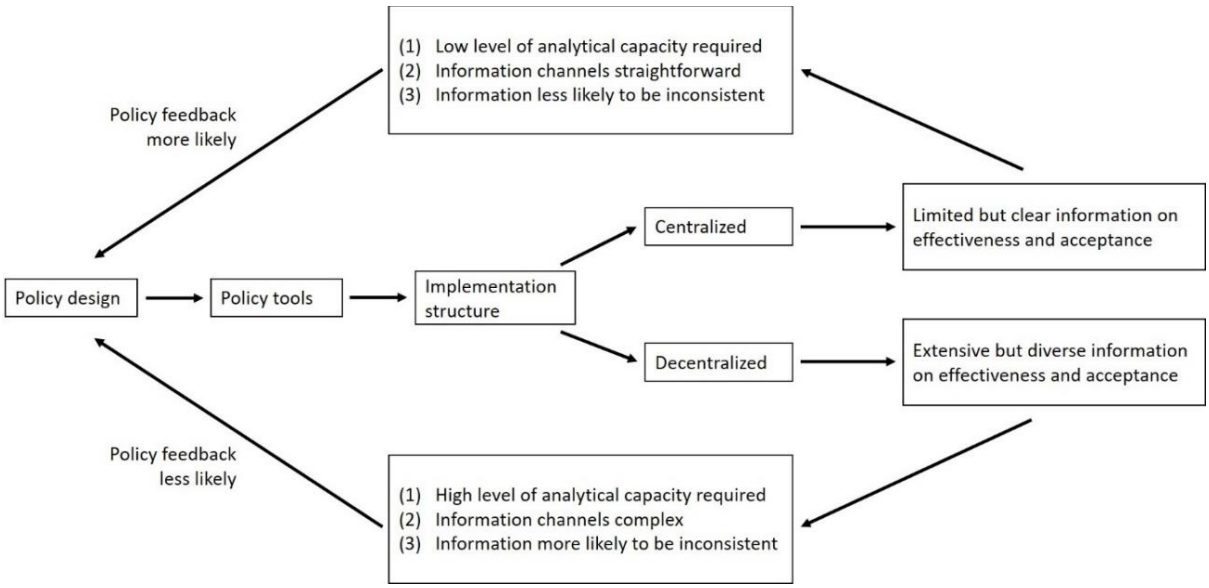
The main argument of Tosun and Treib (2018) is that centralised and decentralised implementation structures have different advantages and disadvantages: Decentralised structures enable situational solutions for different, decentralised problems; different solutions can also be developed for similar problems in a decentralised manner. Decentralised structures therefore favour heterogeneity in problem perceptions and solutions (cf. Table 15 on dealing with diversity or plurality in networks). However, policy designers then also face the challenge of having to process possibly inconsistent information from a series of "policy experiments" for a feedback process in the sense of the policy cycle. This can be successful if the policy designers have particularly strong analytical skills. Centralised structures, on the other hand, allow only relatively limited information on the effectiveness and acceptance of policies; but are associated with higher chances for consistent information processing.

and public actors providing infrastructures for innovation. Institutional-theoretical research on organisations distinguishes, for example, a complex set of six levels (cf. Scott 2014; p. 106: sub-unit of an organisation, e.g. department; organisation; population of organisations, etc.).

[16] Multi-level governance often has a different conceptual thrust in governance research (cf. e.g. Bache et al. 2016). The concept arose in the course of analysing the interaction of "policies" in the multi-level system of the European Union (EU) and the EU member states. There are now a large number of concepts and typologies that have developed from this research. Such a multi-level governance analysis could be particularly instructive for policy mix type VIII (see Table 9).

[17] The analysis from Tosun und Treib (2018) is in the handbook on policy design research published by Howlett and Mukherjee (2018c). Nevertheless, it should be presented here as an element of governance research, since it focuses on the interaction of policy and implementation levels with regard to information processing. This interaction in turn implicates many results of network governance research (cf. Klijn and Koppenjan 2016).

Figure 5: A model of policy design, implementation style and policy feedback



Source: Tosun and Treib 2018; p. 324.

The multi-level analysis from Tosun and Treib (2018) therefore suggests that policy designers who are interested in the accumulation of information and knowledge about "policies" (cf. Howlett 2019a) should not in general adopt a preference for *decentralised* implementation structures. Decentralised implementation can lead to inconsistent findings and gaps in policy feedback processes, especially if policy designers have little analytical capacity. Centralised structures may be less politically acceptable, even if they encourage policy learning. However, such orientation hypotheses require the content to have support from concrete "policies" and conditions of implementation.

Metagovernance

Governance is not a "silver bullet" for coordinating the collective action of actors. This also applies to forms of coordination such as markets, hierarchies and those characterised by solidarity (traditional and non-traditional "communities", cf. Gläser 2007). Governance researchers like Grande (2012) even argue that governance is more likely to fail when there is high intensity of conflict between actors, especially in "moral" conflicts. They warn against overestimating the effectiveness of governance in overcoming interdependencies in the public realm.

In this sense, the concept of metagovernance generally emphasises the diverse sources of weaknesses and errors in the implementation of "policies" and the limits of state controllability in (late) modern societies (cf. Ansell et al. 2017a and Figure 3). "Metagovernance is defined as the 'governance of governance' and involves deliberate attempts to facilitate, manage and direct interactive governance arenas without undermining their capacity for self-regulation too much." (Torfing 2016; p. 525)

The literature on governance contains two conceptually distinct understandings of metagovernance:

- *Metagovernance as the management of networks:* Sørensen and Torfing (2009) carry out a systematic analysis of metagovernance as the control of governance networks by political and administrative actors. They distinguish ideally between (1) metagovernance for the realisation of an effective network and (2) a metagovernance that represents the *democratic*

embedding of networks. With regard to the network design, it is crucial that the actors responsible for effectiveness-oriented metagovernance focus on the achievement of goals and the composition of the network actors according to the (possibly innovative) goals. Such metagovernance is consistent with policy design research (e.g. Howlett 2019a). On the other hand, democratic meta-governance brings networks into the public eye, ensures broad participation of actors and, if necessary, even initiates the formation of alternative networks (Sørensen and Torfing 2009).

- *Metagovernance in response to governance failures:* Metagovernance as network management in the sense of Sørensen and Torfing (2009) aims to focus on the relationship between actors responsible for governance on the one hand and for metagovernance on the other. Trade unions can also exist. A conceptually different understanding of metagovernance, on the other hand, focuses more on the fact that – if all forms of coordination such as markets, hierarchies and networks show their weaknesses and failures – there will be processes and structures that are to be understood as reactions to this failure of forms of coordination. This governance concept, discussed in a number of publications (e.g. Jessop 2011), deals with the limits of state controllability and the possibilities to develop arguments for the successful implementation of policies despite *potentially* ubiquitous weaknesses and occasional cases of failure (in depth, e.g. Torfing 2016).

Work on metagovernance is quite prominent in governance research (cf. Torfing 2016). In governance practice, the first understanding of metagovernance mentioned as an effectiveness-oriented or democratically oriented form of coordination is likely to be of direct importance. Metagovernance is therefore to be understood here primarily as a heuristic reflection concept that can be helpful in not falling into a "naive" purposeful rationalism and design optimism of climate adaptation policy. "Naive" purposeful rationalism is expressed, for example, in the conviction that it could actually be possible to align the policy field of climate adaptation primarily with a future-oriented approach to a comprehensive and coherent system of goals for all action fields of the DAS. This purposeful rationalism could be called naive because it overestimates the importance of medium to long-term *futures* for current political-administrative action (cf. Section 2.2.1.4 above). Reforms in policy instruments relevant to climate adaptation have often been carried out in response to problems, crises and disasters that have already occurred (e.g. risk orientation in flood prevention in response to the Elbe river flood in August 2002, reforms in heavy rain risk management in response to the Ahr Valley disaster in 2021). Exaggerated optimism arises above all with regard to the question of how comprehensive and "deep" climate adaptation can be designed in a goal-oriented manner as a political, administrative and overall social process. Design optimists emphasise the goal-oriented, profound changeability of politics, administration and society. Governance research, on the other hand, tends to emphasise the limited scope of goal-oriented attempts at governance, especially with regard to institutional change.

2.3.2 Starting points for the transfer to the policy field of climate adaptation

The governance research sheds light on procedural starting points in the further development of the DAS, and the Network of Authorities for Climate Change and Adaptation in particular (e.g. strategies of network management, collaborative governance episodes). However, there are also institution-oriented starting points, because the distinction between a network as an implementation network or a governance network (in the sense of the network type

"collaborative and network governance", Klijn and Koppenjan 2016) is important for the collective identity of the network of authorities and such an identity has numerous references to the institutional regulations of the DAS (e.g. mandating the network of authorities). Institutional approaches must also be taken into account in the case of multi-level governance and meta-governance.

2.3.2.1 The network of authorities as a mix of network types

As mentioned above, the Network of Authorities for Climate Change and Adaptation was created as a network of federal agencies and institutions to support the IMAA in the *implementation of the DAS*. Since it was set up in 2017, the network has also increasingly contributed to issues relating to the *development of a policy mix* on climate adaptation (Hetz et al. 2019). By distinguishing between an implementation network ("service delivery and implementation network", Klijn and Koppenjan 2016) on the one hand and a governance network ("collaborative and network governance") on the other, these statements can now be subjected to an in-depth analysis. The reference to the DAS implementation indicates that the network of authorities is an implementation network; the reference to the network's contributions to issues relating to the development of a policy mix indicates that it is a governance network. This would make the network a *mix of the two network types*, which Klijn and Koppenjan (2016) see as quite common in *actual* examples of networks. What could follow from this for the management of the network?

First of all, it should be noted that implementation-oriented network requirements and those that are based on governance as a continuous handling of content diversity are definitely in conflict (cf. Provan and Kenis 2008, Hutter and Bohnefeld 2013, Klijn and Koppenjan 2016). This is evident, for example, in the weighting and orientation towards criteria such as effectiveness and efficiency – these are central to implementation networks; for "collaborative and network governance" they can also lead to an excessively *fast* and *strong* reduction in the diversity of content and impair the innovation potential of the network. It would be possible to determine the relevance of the network types "implementation network" and "governance network" for the network of authorities and, if necessary, set a priority as an orientation for network activities. The aim of such an attempt would be to avoid overburdening the individual NWPs and the network as a whole with performance expectations. In the case of a priority orientation towards the network of authorities as an implementation network, it would be clear that targets that are as concrete and measurable as possible are a necessary condition for the improved application of criteria for the analysis and evaluation of political instruments. In the case of the priority orientation towards the network of authorities as a governance network, on the other hand, the NWP would be given greater leeway in determining target statements and their use in the analysis and evaluation of policy instruments. The distinction between the network of authorities as an implementation network on the one hand and a governance network on the other hand serves primarily to clarify the self-image of the NWP and to make clear which requirements for the DAS action plan result from this. How exactly such an understanding of the Network of Authorities for Climate Change and Adaptation could take place and what advantages and disadvantages of different control options exist within the network is a task for future internal management. As a possibility, it should also be considered that different network activities are geared towards criteria such as effectiveness and efficiency on the one hand and the continuous handling of content diversity on the other to different degrees.

According to Ansell and Gash (2008), the collaborative governance model is suitable for an in-depth empirical analysis of episodes of cooperation between the partners in the network

("governance episodes", e.g. defined by the development of previous DAS action plans). If you look at Figure 4 on the governance model, it is noticeable that the elements contained in the main building block "collaborative process" (meaning "trust building", "face-to-face dialogue", "intermediate outcomes") are based on experiential information in the network of authorities: In the process of establishing and further developing the network, trust was built up among the network partners; intensive dialogue processes took place; proposals for political instruments of climate adaptation could be developed jointly and communicated to the IMAA (Hetz et al. 2019).

However, these experiences within the framework of the network also exposed problems of understanding between the network members (i.e. problems of "joint understanding"), not least for the evaluation of policy instruments of climate adaptation (e.g. application of the criterion of flexibility). Within the framework of network meetings, questions were repeatedly discussed as to how the network is linked to other, more formalised processes of climate adaptation policy (e.g. processes of departmental coordination within the framework of DAS progress reporting) and how the necessary personnel capacities for the implementation of contributions can be guaranteed ("commitment to process"). In the collaborative governance model, such issues are to be analysed partly as procedural issues, partly as questions of institutional design and leadership in the network. Transfer potential of governance research therefore consists in the systematic application of the governance model from Ansell and Gash (2008) to the empirical case of the Network of Authorities for Climate Change and Adaptation. It makes sense to pay special attention to the *dynamics* of governance *episodes* (Klijn and Koppenjan 2016).

2.3.2.2 Decentralised and centralised implementation of climate adaptation policies

Governance as network-based coordination goes beyond individual networks (such as the network of authorities) and addresses the wide-ranging relationships between actors on the spatial-institutional levels of the DAS (see Figure 1 above). As mentioned, the policy mix typology of policy design research also addresses options for vertical levels (e.g. Type VI as sectoral policy mix and Type VIII as maximum programme of policy integration). The policy feedback model from Tosun and Treib (2018), among others, is useful for the transfer of the multi-level governance research.

According to Tosun and Treib (2018), policy feedback processes for "policies" with a high level of teleological ambition require a certain limitation on the amount of decentralised freedom the actors have at the implementation level. Restrictions can include policy content and the number or institutional characteristics of actors, to name just three examples. Policy feedback processes that place greater value on the exploration of new instrumental possibilities, on adapting to different decentralised framework conditions and on granting the actors of implementation degrees of freedom would require decentralised implementation structures. When it comes to questions of the implementation of policy goals and instruments in the DAS action fields, a distinction should be made as to whether criteria such as effectiveness are in the foreground (then presumably central implementation, if compatible with efficiency, e.g. with regard to the use of financial instruments) or whether decentralised experiments and diversity of content should provide a "breeding ground" for future innovations (then decentralised implementation). In addition to a mix of network types, the improvement of the DAS would also involve designing the combination of different implementation structures.

2.4 Transition and Strategy Research

2.4.1 Social change processes and strategy development

Policy design research enables a systematic analysis of policy instruments, instrument combinations and policy mix types. Governance research provides an analysis of network types and network processes that take place in the form of governance episodes. Both research directions provide concepts for the analysis of strategies in the context of multi-level governance. The following explores questions of strategy development in social change processes as an *addition* to policy design and governance research. Because policy design and governance research focuses on the *intentional*, collective action of actors in state and society (Grande 2012, Ansell et al. 2017a). However, such action is embedded in complex social processes that can only partially be controlled intentionally. For *long-term* climate adaptation policy, it is important to address possibilities of strategy development in societal change processes that go beyond policy design and governance research.

However, a comprehensive analysis of these possibilities is beyond the scope of this report. The following focuses on two selected topics: understanding disruptive change and using windows of opportunity for climate adaptation strategy development. It concretises these topics with concepts from transition and strategy research. The former addresses fundamental social change; the latter shows which strategy processes lead to the use of windows of opportunity for fundamental change. Subsequently, the report examines the transfer potential of these concepts to the policy field of climate adaptation.

2.4.1.1 Fundamental social change as regime change

Research on the prerequisites, forms and effects of transitions[18] have gained prominence in recent years (Geels 2011, Loorbach et al. 2017, Hölscher et al. 2018, Köhler et al. 2019). In particular, research that is based on the normative guiding principle of sustainability is also interested in concepts of fundamental social change. Because if sustainability-oriented analyses determine that certain social processes are *not* sustainable (e.g. in view of the loss of biodiversity or catastrophic consequences of extreme natural events in the context of climate change), this also brings up the question of how unsustainable processes can be effectively changed in the direction of sustainability goals (Loorbach et al. 2017).

Against this background, transition research will be discussed in more detail below (cf. Köhler et al. 2019 for an overview).[19] On the one hand, transition research has developed a set of concepts to analyse social change (cf. Loorbach et al. 2017 as well as Figure 6a-c below, see also the overview in Köhler et al. 2019). On the other hand, it has applied this set of concepts to different scales of social development: from niches at the micro-level of social action to regime change at the meso-level, to transformations of society as a whole.

[18] The term "transition" is relevant for the following. The term "transformation" is often found in research literature and in social discourse. Both terms are occasionally used as synonyms. Wolfram et al. (2016; p. 19) point out that transformation designates both: the process of changing system configurations as well as the result of such a change in the sense of a changed configuration of a system, while the term "transition" is essentially meant to be processual (e.g. in a narrow sense as process the transition from one configuration to another). Hölscher et al. (2018) see numerous similarities between transition and transformation. However, they also emphasise the *difference* that transitions are primarily geared towards the change in societal sub-systems ("...change in societal sub-systems [e.g. energy, mobility, cities]...", Hölscher et al. 2018; p. 2); a transformation could be understood as *total* societal change ("large-scale societal change processes...", Hölscher et al. 2018; p. 2). This understanding is to serve as a foundation in the following.

[19] The statements in this report represent a simplified version of transition research on fundamental change as regime change. Differentiating analyses that, on the one hand, take into account the variety of concepts and, on the other hand, address the difficulties of operationalising concepts such as "regime" can be found, for example, in Geels (2011) and Köhler et al. (2019).

Regimes and regime change are central to understanding transition research (Geels 2011). Regimes are complex configurations of specific user preferences, markets and industrial structures, technologies, infrastructures and scientific knowledge bases as well as culturally anchored values and norms and policies. Societies are made up of multiple regimes. Incremental change in regimes, while occurring all the time, is defined as change *inside* the configuration of a regime, not as changing the elements or the structures between elements, which would amount to changing the regime itself. Regimes are characterised by a "dynamic conservatism" (see Figure 6c). Actors with central positions in the regime may tend to prevent fundamental change because doing so would jeopardize the centrality of their position.

Regimes are embedded in numerous contextual conditions that transition research conceptualises as a "landscape". The term "landscape" is meant more metaphorically and also includes, for example, institutionalised ideas, rules and expectations. A landscape is subject to a certain dynamic and change. For example, the concept of individuality is of great importance for modern Western societies. Regimes such as the transport, energy and food sectors have long been influenced by ideas about the individuality of people – up to and including motorised individual transport (MIV). At the same time, from a long-term perspective, ideas about the individuality of people point to (Geels 2011) a dynamic and change that can be described as a change from the industrial society to the late modern society of "singularities" (cf. Reckwitz 2019). Changes at the "landscape" level can lead to pressures on regimes to change and meet new requirements.

Transitions in the sense of regime change take place over periods of several years. Historical analysis of transitions suggests that the rate at which one regime changes to another is not linear. Rather, historical examples show that there is initially a relatively long phase with many niche activities with a certain potential for innovation that, however, does *not* get established in the market or wider society ("predevelopment", cf. Figure 6b). Finally, there are phases of accelerated innovation activity and increased dissemination of niche activities with innovation potential, which transition research refers to as acceleration and take off (ibid.). In the ideal case, a sustainable regime develops from a non-sustainable regime as a new configuration of dominant user preferences, markets and industrial structures, technologies, infrastructures, policies, values and norms ("stabilisation"). However, transition research also considers that change processes can "fail" (a sustainable regime is not achieved, etc., see Figure 6b).

Figure 6: The original multilevel, multiphase perspective on transitions

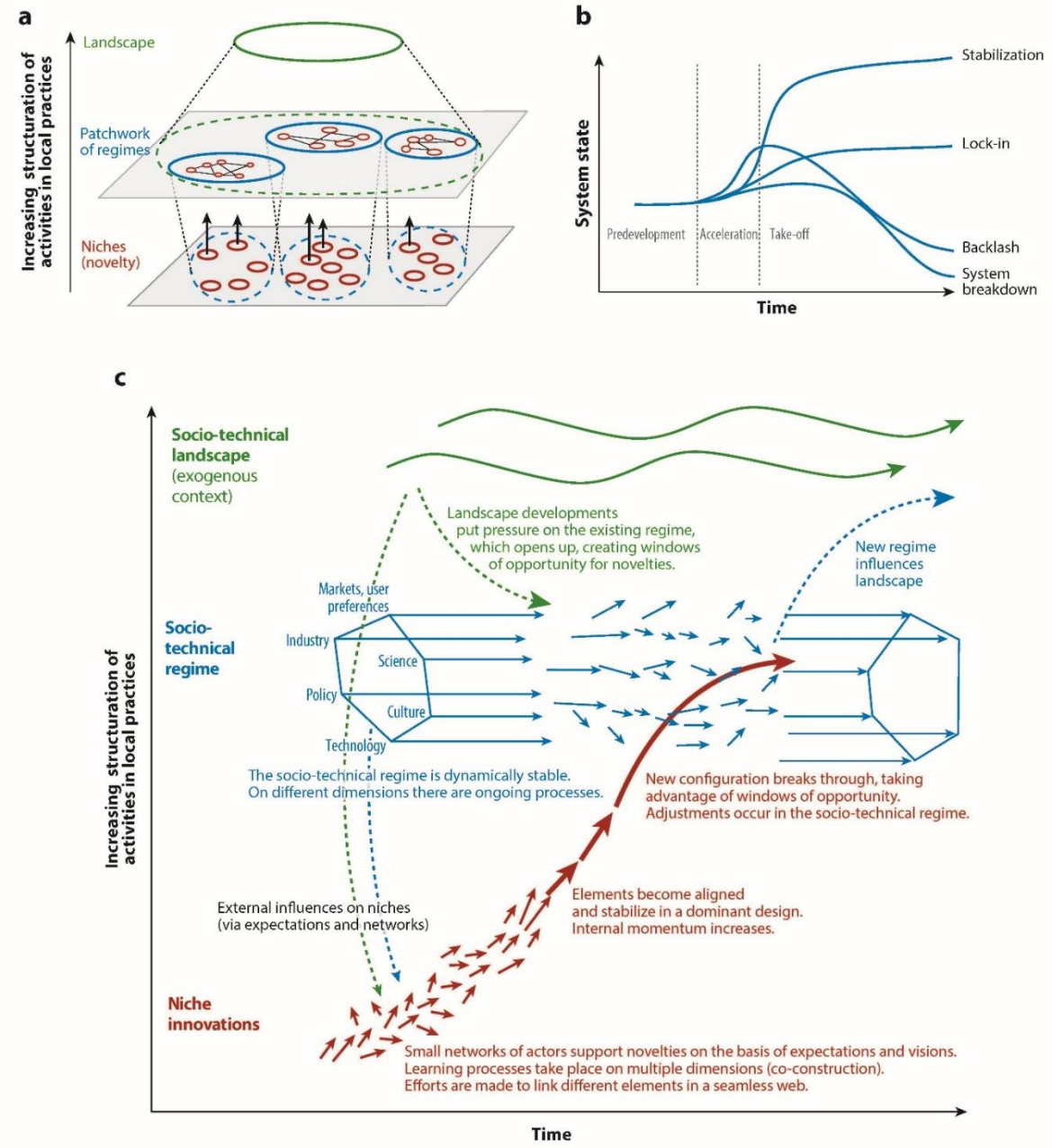


Figure 1

The original multilevel, multiphase perspective on transitions with (*a*) the multilevel model depicting the coevolution between landscape, socio-technical regimes, and niches; (*b*) socio-technical regime change as result of coevolving landscape pressures and emerging niches over time; and (*c*) the multiphase concept illustrating the nonlinearity of transitions and different types of pathways. Panels adapted with permission from References 35, 4, and 124, respectively.

Source: Loorbach et al. 2017; p. 606 (the title of Figure 6 above has been added, see Loorbach et al. 2017; p. 605).

Central to this conceptualisation of change is the idea of "disruption". If regimes change due to pressure from overarching context conditions and on the basis of already existing niche activities, this presents itself from the perspective of the existing regime as a "disruption (interruption)" to previously stable relationships and incremental change processes. There is therefore agreement that transition research is primarily interested in disruptive change i n

order to establish solutions to "big" societal problems that cannot be solved with incremental (i.e. "small") improvements *alone* (cf. Geels 2011, Loorbach et al. 2017, Köhler et al. 2019).

Regime change is (1) characterised by a multi-year process. It results (2) from the interaction of "landscape", at least one regime and activities in niches. It can (3) only be determined when there is a change in numerous dimensions of a regime and (4) will probably often be characterised by resistance from central actors to regime change. (5) In retrospect, the change that took place towards sustainable regimes can be described and analysed as a "disruption" and more or less intentional change in an existing regime. Transition research, in particular the socio-institutional perspective on transitions (cf. Loorbach et al. 2017), therefore assumes *that there is no automatic process moving in the direction of more sustainability.* Rather, it requires overcoming political conflicts and strategically motivated actors so that social changes in the sense of sustainability transitions actually take place.

The understanding of transition as the disruptive and non-linear change of a regime is a kind of "vanishing point" for transition research. With regard to this understanding, it classifies numerous concepts, theories and findings from various research directions (from evolutionary economics, to institutional theory to policy and governance research, etc. cf. Geels 2011, Loorbach et al. 2017, Köhler et al. 2019). The understanding of transitions as disruptive regime change certainly leads to an emphasis on the use of concepts for strategy development in complex social change processes. This is to be shown in the following two examples: (1) the distinction between pilot projects and transition arenas, with this report uses to examine the content of strategy development more closely; (2) the understanding of linear strategy processes, which reflect the requirements of the plannability of social changes (Wiechmann 2008, Hutter et al. 2019).

2.4.1.2 Pilot projects and transition arenas

The distinction between a regime on the one hand and niche activities and contextual conditions on the other is central to explaining the dynamics of transitions. Niche activities are a necessary, though not a sufficient, condition for explaining transitions. In addition, there must be changes in the context conditions, so that the interaction of "landscape", niche activities and a destabilised regime opens up possibilities for a successful transition. Last but not least, this understanding of change leads to a critical assessment of the ability of existing regimes to bring about fundamental change through *self-initiated ("endogenous")* activities. In the meantime, however, transition research does not rule out that there are also tensions *inside* of regimes and that regime actors themselves may be interested in initiating and shaping fundamental change (Köhler et al. 2019).

The distinction between pilot projects and transition arenas should be considered against this background (cf. Loorbach et al. 2017 based on Buuren and Loorbach 2009). Table 16 contrasts pilot projects and transition arenas based on a number of selected characteristics (cf. Buuren and Loorbach 2009). Two features should be mentioned here:

(1) Actors in pilot projects are looking for innovative solutions to problems that they define based on the *existing* problem knowledge. It is also reasonable to assume that results from successful pilot projects tend to improve on an *incremental* basis. Last but not least, this has the advantage that the innovation achieved can be precisely determined. Transition arenas, on the other hand, do not focus on innovations that are defined as precisely as possible, but – with a view to the "big" challenges of unsustainable societies – on visions for more sustainability in social areas (e.g. transport, energy and food sectors) or more resilience against the highly

unpredictable impact of climate change in heavily urbanised areas (Loorbach et al. 2017). Processes of vision formation should open up possibilities for thinking about solutions that go well beyond incremental outcomes with short-term benefits.

(2) Pilot projects are a "safe space" for the search for innovations, which should be linked as closely as possible to existing political-administrative structures and institutions. A transition arena, on the other hand, is formed as a "safe space" with a certain distance from existing political-administrative structures and institutions. It's about vision-driven regime change. *Shielding* against the pressure to succeed in the sense of short-term exploitable project results is a task for the establishment of transition arenas. The actors for transition arenas are therefore not selected with a view to guaranteeing the greatest possible connectivity to existing social structures, but from the point of view of openness and the possible content potential for a vision-oriented process (cf. Table 16).

Table 16: Pilot projects and transition arenas

	Pilot Project	Transition Arena
Selection of participants	Based on involvement in the problem and pull	Based on background, innovation potential and image
Objective	Innovative solutions	Sustainable visions and pathways
Structure of process	Low-level structure, bottom–up	Expressed innovation philosophy
Position arrangement	Safe haven within administrative networks	Safe haven outside administrative networks
Intended effect	Multi-purpose use of space/area	Social movement towards sustainability
Preparation of reception of innovation	Power of the process (support, feasibility)	Power of the product (image, quality) and participants

Source: Buuren and Loorbach 2009; p. 380.

Table 16 ultimately reflects the medium to long-term orientation of transition research and the understanding of change as disruptive regime change within the framework of the multi-level perspective (see Figure 6c). It is probably not about propagating one thing as an alternative to the other, but about the question of how projects or arenas are geared towards incremental innovations that can be used to a large extent in the short term (i.e. a pilot project) or towards a vision-driven constellation of actors with the goal of a contribution to the realisation of medium to long-term transitions (i.e. transition arena).

2.4.1.3 Linear and adaptive strategy processes

The term "strategy" is a term often used in both academia and in practice. It is less common in n policy design research; in governance research, for instance, Klijn and Koppenjan (2016)

consider the example of network management strategies.[20] The expression of the strategy and the idea of a strategically capable actor articulate the notion that is widespread in society that actors, especially organised or collective actors, have the ability to intentionally shape their own actions and, under certain framework conditions, also to achieve desired results. In the social sciences, the notion of an "actor" is somewhat associated with the notion of a *strategic* actor. In the meantime, independent strategy research has set itself apart (cf. e.g. Wit and Meyer 2010, Clegg et al. 2011).

Geels (2011) argues that the charge against transition research that it *does not sufficiently consider* how actors intentionally shape social processes is inaccurate, in general. However, he also emphasises that questions of strategy development in the context of the outlined understanding of transitions as a disruptive change of regimes should be considered even more extensively and in depth. Current review articles on transition research show that numerous results have been presented in this regard in recent years (Köhler et al. 2019). These results converge in many respects with the work of strategy research. This can be illustrated using the example of the distinction between a linear and an adaptive strategy model (see Table 17).

Table 17: Two process models of strategy

	Linear model	Adaptive model
Context	Stable and predictable	Unstable and limited predictability
Process	Sequential process of planning, programming, implementation, evaluation, and learning Top-down strategy making	Continuous alignment of process, content and context Combination of bottom-up initiatives and top-down strategic decisions
Content	System of aims, targets, and strategic alternatives Integrated set of strategic, operative, and resource plans	Strategic orientation through a limited set of value judgements, principles, and concepts Complex and flexible constellation of capacities and resources

Source: adelphi (revised version of Hutter 2006; p. 236).

The starting point of strategy research is the assumption that there can be no "silver bullet" for successful strategy development under all possible framework conditions. If the context of the strategy development can be regarded as approximately stable and predictable in its basic features, this would suggest a linear strategy. If, on the other hand, the context is characterised by high instability, diverse turbulence and only very limited predictability, then an adaptive strategy model would apply.

Linear strategy development is characterised by the fact that goals are formulated step-by-step in a controlled manner at different levels of abstraction and options for goals are developed,

[20] Since the mid-1990s, planning research has increasingly used the terms strategy and strategic planning. This applies to Anglo-Saxon international planning research as well (e.g. Salet und Faludi 2000, Albrechts 2004, Healey 2009, Albrechts 2017). This also applies to work in German-speaking countries (e.g Wiechmann 2008, Vallée 2012, in summary Hutter et al. 2019).

discussed, evaluated and then implemented. The term "linear" means a step-by-step approach that ideally leads to an integrated set of strategic, operational and resource-related plans.[21]

With increasingly unstable and unpredictable framework conditions, however, the linear model leads to ineffective strategy development. The integration of strategic, operative and resource-related plans turns out to be irrelevant – even counterproductive – for the strategy-oriented actions of actors in organisations. The strategy's adaptive model therefore emphasises the need to respond to increasing instability and unpredictability through a continuous and iterative process of "mutual adjustment" of goals and means. Actors in an adaptive strategy process do not primarily act "according to plan", but orientate themselves on a limited set of value judgments, principles and concepts that do not specifically specify future strategy-relevant action, but only facilitate decisions in dynamically changing situations. Strategies result from the interaction of (as few as possible) strategic decisions "from above" and a large number of individual initiatives and individual actions "from below".

Patsy Healey (2009) has, following the work of Mintzberg (1994) and others, developed an adaptive understanding of strategy, which could also be of use to the improvement of the DAS. According to Healey , at its core, strategy is understood as a "selective focus" through which actors gain orientation in the face of complex and potentially confusing issues, ideas, claims and arguments. Healey emphasises the *synthetic* character of strategies. Strategies that, at the same time, provide orientation and motivate action in accordance with this orientation are not only expressed in plan documents based on an analysis-intensive procedure. They can take very different forms (e.g. concepts, images, principles). It is crucial that the actors involved in the strategic process actually use a strategy in numerous activities and decisions to perceive the problem and search for a solution.[22]

Strategy research does not argue *fundamentally against the linear strategy model*, but calls for the contextual conditions for a highly controlled and step-by-step approach to strategy development to be taken into account (cf. Wiechmann 2008; p. 60). If necessary, strategy problems can be effectively solved using a linear approach, as long as the problem definition is narrowed down, so that stable and predictable framework conditions with a high level of plausibility can be expected.

With regard to the use of windows of opportunity in transitions for the realisation of the goals of climate adaptation, however, it is reasonable to assume that an adaptive understanding of strategy can claim priority. Because transitions, as explained, do not take place as linear social change processes; in their concrete manifestations, they are not individually predictable. In order to prepare for the use of windows of opportunity in social change processes, the overarching orientation towards an adaptive strategy model is obvious. Such a model combines orientation in as few fundamental decisions as possible with the development of complex but flexible constellations of skills and resources.

[21] The understanding of "linear" and "non-linear" in transition research, on the other hand, is more oriented towards the mathematical concept of linear and non-linear functions, whereby Figure 6b above makes a functional connection between time and intensity of the structuring of local practices.

[22] Healey (2009) develops this understanding of strategy specifically for spatial planning. However, the methodological possibility of articulating strategies based on concepts, images, principles and also planning documents exists in numerous policy areas (Ansell und Gash 2008).

2.4.2 Starting points for the transfer to the policy field of climate adaptation

Policy design and governance research on the one hand and transition and strategy research on the other differ in their perspective. Policy and governance researchers look from politics and administration to social framework conditions and their changes (see Figure 3). Transition and strategy researchers look at the long-, medium- and short-term goals, instruments and measures in civil society, business, politics and administration, etc., based on social change processes. Transition research makes more systematic distinctions than policy design and governance research between short-, medium- and long-term concepts (cf. Loorbach et al. 2017, Köhler et al. 2019). However, there are also numerous intersections between policy design and governance research and transition and strategy research (cf. Köhler et al. 2019). For Loorbach et al. (2017) governance is at the "heart" of transition research. Against this background, the following addresses three starting points for the transfer of transition and strategy research to the policy field of climate adaptation.

2.4.2.1 Analysis of disruptive change in the DAS action fields

Existing research on the DAS already makes use of the distinction between incremental and radical change processes (cf. e.g. Mahrenholz et al. 2017). This distinction offers a starting point for the in-depth analysis and interpretation of the transfer potential of transition and strategy research. Of particular importance is the differentiated understanding of different forms of transitions (Geels 2011, Köhler et al. 2019), which are concretely expressed in the interaction of regimes, niches and contextual conditions ("landscape"). It would be of interest for the DAS to determine the types of observed and expected change in the DAS action fields. It would also be interesting to see whether disruptions and the reactions to and strategies for disruptions differ systematically according to the action field. The transfer of transition and strategy research specifically to the DAS would be reflected in new empirical findings to describe and explain change processes (cf. Turnheim et al. 2018). More knowledge about disruptive change processes that are already taking place, not to mention possible future disruptive change processes in the DAS action fields, would represent a critical foundation for gearing climate adaptation policy to the medium and long-term use of windows of opportunity for implementation of *its* goals.

2.4.2.2 Preparing for windows of opportunity in sustainability transitions

It is entirely conceivable that transition and strategy research could be applied to the DAS itself. To this end, it would first have to be clarified *if* and how the policy field of climate adaptation can be meaningfully described as a "regime" in the sense of transition research (cf. Geels 2011). Only then would it be possible to ask about the conditions, change processes and effects of the transition to climate adaptation policy itself. *However, this report has ignored this question.* We have explored how transitions in policy areas other than climate adaptation can be opportunities for DAS strategy development.

The concept of a window of opportunity in the sense of transition and strategy research makes it clear how important both the identification and the strategically oriented use of such "windows" are. As mentioned, windows of opportunity arise from the specifically unforeseeable coincidence of processes on the levels of the "landscape", a partially destabilised regime and on the basis of a "breeding ground" for change that already exists through niche activities in accordance with the goals of sustainability.

A regime would be understood, for example, as the national regime for how society deals with flood and heavy rain risks (at the federal, state and local levels, with regard to certain flood prevention technologies, housing preferences and developments in the real estate market, etc.).

Niche activities could be undertaken by private and civil society actors as well as by public actors who are aware of the limitations of effective flood risk management and therefore *don't overestimate* the possibilities of proactive risk reduction under climate change conditions (see. Hutter 2016, Hutter and Lorenz 2018). For climate adaptation policy, such a coincidence with change processes in the regime of risk management of floods and heavy rain events could prove to be an opportunity to clarify what is "special" about the consideration of climate change in existing risk management instruments. There could be the possibility to propagate entirely *new* instruments for the management of flood and heavy rain risks (cf. policy design research on this e.g. Howlett 2019b). For actors of the regime of flood and heavy rain risk management that are already transition-oriented, there would be opportunities for a transfer of learning from other action fields of climate adaptation to their own concerns (e.g. for considering and dealing with uncertainties).

Strategy development with regard to the use of windows of opportunity for climate adaptation requires intensive preparation and knowledge integration with regard to unpredictable constellations. It is therefore obvious that strategy-oriented actors rely on such constellations through an adaptively created *portfolio,* preparing options for strengthening interdependencies between the DAS and other policy areas.

2.4.2.3 Possible starting points in the Network of Authorities for Climate Change and Adaptation

The transfer potential of transition and strategy research for the Network of Authorities for Climate Change and Adaptation depends to a large extent on how the network is handled as an implementation and governance network. In terms that provide a lot of contrast (and simplify the complex situation somewhat):

a) if the network gives priority to an *implementation network* and is to be controlled more traditionally using the criteria of effectiveness, flexibility and efficiency, it is *not* to be assumed that there are many starting points for the transfer of transition and strategy research. The optimisation of the network would be sufficiently possible through the transfer of policy design and governance research.

b) However, if the network of authorities took into account criteria such as coherence and synergy potential to a greater extent, and also pursued a higher level of ambition with regard to its contribution to radical change processes for long-term climate adaptation, there would probably be more transfer potential for transition and strategy research.

Ultimately, the weighting of evaluation criteria for the further development of the network within the framework of the DAS is, again, decisive (as mentioned above) – not only with regard to the development of proposals for political instruments, but also for the development of the network as a whole.

2.5 Summary Conclusions

The analysis presented here is dedicated to the scientific-theoretical approaches to the development and evaluation of a policy mix, policy design and related research areas. Our aim was to use a literature analysis to identify starting points that appear suitable for transfer to the policy field of climate adaptation. Such starting points could have been, for example, of a

methodological, process-oriented or institutional nature. With this objective in mind, we can draw the following conclusions:

(1) *Policy design research* has engaged intensively with the development of a complex policy mix typology. This typology allows a distinction to be made between analyses and assessments of individual instruments, combinations of instruments and types of policy mix in the narrower sense. Depending on what is being evaluated (an individual instrument, a combination of instruments with regard to one or more objectives, a specific type of policy mix) there are systematic consequences for the application of criteria such as effectiveness, flexibility, efficiency, coherence and synergy potential in the development of proposals for policy instruments, not least in the Network of Authorities for Climate Change and Adaptation.

(2) *Governance research* is ideal for the analysis of procedural starting points in climate adaptation networks in light of institutional factors – whereby a narrow understanding of governance as a network-based form of coordination is preferable to a broad, diffuse understanding. The literature analysis underlines the high importance of differentiating between network types. For the network of authorities, it is assumed that the two types "service delivery and implementation" (i.e. an implementation network) on the one hand and "collaborative and network governance" (i.e. governance network) on the other hand are particularly important. This distinction results in key starting points for the further development of the network of authorities. This is reflected, for example, in the weighting of evaluation criteria. Implementation networks emphasise criteria such as effectiveness and efficiency; governance networks, on the other hand, emphasise criteria such as synergy potential and innovation. In reality, however, mixtures of network types are also to be expected, which in turn results in challenges for the management of a network (e.g. assignment of criteria, content and activities in network management).

(3) Climate adaptation policy also "naturally" has a significant long-term component, so to speak. *Transition and strategy research* differentiates between different time horizons of concepts to a greater extent than policy design and governance research and pays increased attention to long-term, vision-driven change processes. Current reviews on transition and strategy research were therefore also included in the literature analysis. It was shown that transition research primarily promotes an understanding of disruptive regime change and the opening of windows of opportunity. Preparing for such windows of opportunity tends to require adaptive strategy processes in the sense of strategy research.

The literature analysis did not deal with the regime change of climate adaptation policy itself, but with the question of how windows of opportunity in the processes of other policy areas could be used to their advantage. The roles such windows of opportunity play in the DAS and especially in the Network of Authorities for Climate Change and Adaptation depends to a large extent on whether this network is to be understood more as an implementation network, or more as a governance network. In the case of the latter in particular, it can be expected that transition and strategy research will be taken up more intensively.

3 Comparing the Field of Climate Change Adaptation in Germany with other Federal Strategies

The aim of this policy field analysis was to identify starting points for optimising the action planning process, stakeholder participation and management of the DAS process by comparing the DAS with other federal strategies. At the beginning of the analysis, additional cross-departmental and cross-level federal strategies were selected and compared to the DAS. Based on a literature and document analysis as well as interviews with experts, guidelines for optimising the DAS and APA processes were then worked out. Of particular importance were issues of stakeholder cooperation, coordination and dialogue processes, which led to a selection of measures for implementing the strategy. Of specific analytical relevance were the questions of how the diverging stakeholder interests are balanced within this process, as well as the methodological and institutional characteristics of the procedure. Also of analytical interest were indications of which selection criteria were used to prioritise measures. The results served the goal of optimising the strategic development and implementation of the DAS.

This part of the report is structured as follows: The first chapter explains the methodology. In particular, it discusses the analysis structure, the selection of the strategies to be compared and the sources used. The report then presents the results of the analysis of the selection, evaluation and prioritisation of policy instruments and measures, the role of networks and advisory bodies, and the coordination between and involvement of relevant stakeholders. Finally, the report brings together the identified starting points for optimising the APA process and the DAS in a synthesis chapter based on these three main areas of analysis and makes concrete recommendations.

3.1 Methodology

3.1.1 Analysis structure

The analysis structure used here resulted from the strategy process of the DAS, which covers the policy field of climate adaptation (Vetter et al. 2017), and the actors involved in this and their activities. According to Peters (2018) the emergence of a policy field can be understood as a design process that follows several steps. First, a problem must be identified, after which means are selected that address this problem. Institutions are then created that are responsible for implementing the policies (Peters 2018). This process of policy design is made more difficult by the occurrence of complex problems, which are also known in the political science literature as "wicked policy problems". (Danken 2017; Christensen et al. 2019). Such a "wicked policy problem" is characterised by the fact that it is highly complex; for this reason it cannot be solved within a policy field or at an administrative level and requires coordination between different actors, organisations and levels (Head and Alford 2015; Lagreid and Rykkja 2015). In addition, these actors, organisations and levels often have a divergent understanding of the problem (Danken 2017).

Climate change and adaptation to it represents such a "wicked policy problem". (Head 2019). Even if there is by definition no one optimal solution to "wicked policy problems", functioning coordination between the relevant actors, organisations and levels is listed as a determinant of functioning policy design (Head and Alford 2015). Adaptation to climate change is a relatively new policy area in Germany and has been developing steadily since the national climate protection programme was passed in 2005 (The Federal Government 2015). Subject areas were

derived from previous activities in the context of the DAS process and their evaluation and identified weaknesses, for which a comparative analysis of other strategies promises valuable information for optimisation.

On the one hand, this concerns the process of selecting and prioritising policy instruments for the APA. Since climate adaptation policy, after a conceptual phase, will move into an implementation-oriented phase with ongoing activities in the next few years, an optimised process for identifying and selecting suitable measures and packages of measures is of central importance. The aim of the first analysis focus is therefore to analyse the selection and prioritisation processes of concrete policy instruments and measures in other federal strategies and to identify starting points for optimising the DAS. Questions relevant to the comparison include how the selection and definition of policy instruments and measures took place in further strategy processes and whether these were prioritised in the selection.

Against the background of the role of the Network of Authorities for Climate Change and Adaptation in the strategy process and action planning in the policy field of climate adaptation, the question arises as to the establishment and functioning of networks and advisory bodies in the strategy processes of other federal strategies and what insights can be derived from this. This question represents the second focus of the present analysis. The DAS evaluation report published in 2019 also points to potential for optimisation in the coordination between the actors involved and the involvement of other stakeholders (Gaus et al. 2019). This resulted in the third focus of analysis, which examines the various participation processes, coordination and involvement of stakeholders within the selected strategies.

Within the above-mentioned focal points of the analysis, further political strategies of the Federal Government are selectively compared with the strategy process of the DAS. In order to make this selective comparison clear, selected good examples are integrated and explained in boxes in the text. Other strategy and action planning processes or expert councils and stakeholder forums selected for comparison and their characteristics are summarised using the comparison criteria in tables at the end of the respective section.

3.1.2 Selection of the strategies to be compared

At the beginning of the project, a number of cross-departmental and cross-level strategies of the Federal Government were selected, which were then selectively compared to the DAS in a comparative policy field analysis. The term “strategy” is used by the Federal Government in different contexts. There are also different understandings of the term “strategy” in strategy research. (Hutter et al. 2019). For the comparative analysis of cross-departmental and cross-level strategies, it makes sense to understand strategy as a (more or less explicitly formulated) plan for achieving overarching political goals (policy dimension). Strategies were selected for the present analysis which, on the one hand, represent government strategies adopted by the Federal Cabinet and, on the other hand, imply concrete implementation measures. The focus was not necessarily placed on the term “strategy”, but also included national action plans.

The following characteristics were decisive in the selection of the examined policy strategies:

- Large number of actors involved from different areas: One characteristic of the DAS is the high number and diversity of the actors involved. Since a special focus of this analysis was on the role of the network of authorities, the cooperation and dialogue process within the framework of the political strategies were of central interest.

- Participation of various departments and political levels: The necessary integration of, as well as the coordination and dialogue between, different federal departments and across political levels (from the federal to the municipal) are an important feature of the DAS. In order to be able to analyse similar processes, integration strategies were selected that are also characterised by this.
- Overall social relevance: The problem of adapting to climate change affects all areas of society and represents a cross-sectoral policy area. A similar relevance to society as a whole was therefore an important criterion for the comparability of the selected strategies.
- Definition and prioritisation of first measures: In order to obtain valuable insights for optimising the prioritisation process in the future, strategy programmes were preferably selected that have already gone through at least part of the process of defining, prioritising and implementing measures.
- Overarching approaches: Another challenge of the DAS is the wide range of measures to be implemented. Strategies whose instruments range from information, economic instruments, public procurement and support measures to regulatory law were therefore particularly valuable for a comparison.
- Divergent interests of the various departments: One major obstacle in the implementation of prioritisation processes is the frequently divergent interests of the departments involved. In order to ensure good comparability, political strategies were selected that are also characterised by diverging interests of the relevant ministries.
- Internal voting committees for implementation: An explicit focus of this comparative policy analysis was on the coordination processes for the further development and implementation of policy strategies. The existence of separate committees for this process was therefore another criterion in the selection.
- Financial relevance: Depending on the financial relevance of a political strategy, i.e. the costs associated with the implementation of the strategy, its overall importance also changes. A high level of significance can in turn lead to a strategy being much more controversial. This aspect was therefore included as an additional criterion in the selection.

A number of work steps were carried out in order to arrive at a final determination of the selected strategies. First, an initial search for federal strategies potentially suitable for the analysis took place. The project team focused this survey on the Federal Government's annual and business reports. The strategies mentioned in the current progress report, which are related to the DAS, were also taken into account in this process, but did not represent the primary search framework.

The team determined the strategies to be compared with the help of a literature search. The literature database on the Federal Government's website served as the first point of contact for the research. The words "strategy" and "action plan" served as search terms. The term "strategy" is not necessarily included in the title, which is why other papers with a strategic orientation could also be included with the help of this search. In addition to this research, the project team reviewed strategy papers available on the websites of the federal departments under the "publications" tab and, where appropriate, included them in the selection. The team rounded off

the systematic literature research with a search based on the snowball principle, whereby we looked up sources and literature references and reached out to personal contacts and experts who had already been interviewed. We asked them about additional relevant strategies in the course of the research process.

On the basis of the analysis structure, we identified and analysed strategy processes list in Table 18: Strategies for selective comparison based on a literature search. The identified and selected strategies are each assigned to the focus of analysis for which they were examined in detail.

Table 18: Strategies for selective comparison

Analysis point 1: Selection and prioritisation of policy instruments	Analysis point 2: Expert councils and stakeholder forums	Analysis point 3: Non-permanent formats for involving stakeholders and the public
▶ National Bioeconomy Strategy	▶ National Bioeconomy Strategy	▶ National Bioeconomy Strategy
▶ Government Demographic Strategy	▶ Government Demographic Strategy	▶ Government Demographic Strategy
▶ Digitisation Implementation Strategy	▶ National Action Plan on Energy Efficiency	▶ National Action Plan on Energy Efficiency
▶ National Action Plan on Energy Efficiency	▶ High-Tech Strategy 2025	▶ Government Strategy "Living Well in Germany"
▶ High-Tech Strategy 2025	▶ National Integration Action Plan	▶ National Integration Action Plan
▶ National Integration Action Plan	▶ Federal Government Mobility and Fuel Strategy	▶ Climate Protection Plan 2050
▶ Federal Government Mobility and Fuel Strategy	▶ German Sustainability Strategy	▶ Federal Government Mobility and Fuel Strategy
▶ German Sustainability Strategy	▶ German Resource Efficiency Program	▶ German Sustainability Strategy
▶ National Action Plan against Racism	▶ National Action Plan on Business and Human Rights	▶ German Resource Efficiency Program
▶ German Resource Efficiency Program		▶ National Action Plan to Implement the UN Disability Rights Convention
▶ National Action Plan to Implement the UN		

Analysis point 1: Selection and prioritisation of policy instruments	Analysis point 2: Expert councils and stakeholder forums	Analysis point 3: Non-permanent formats for involving stakeholders and the public
Disability Rights Convention ▶ National Action Plan on Business and Human Rights		

3.1.3 Analysis methods and sources

To implement the comparative policy field analysis, we carried out a literature and document analysis as well as a series of interviews with relevant experts.

As part of the literature analysis, we collected and compared relevant information on the three main areas of interest. Sources included, in particular, national strategy documents as well as plans of action and measures, annual and progress reports, work plans and publications of the Federal Government that deal with the development, implementation or updating process of a strategy. In addition, there was an analysis of academic literature, e.g. supporting research and recommendation papers, but also evaluations of selected policy areas. Based on the analysed documents, we reconstructed and examined the development, implementation and updating phases of national strategy processes.

Since, in addition to the selection and prioritisation of political instruments, another focus is the role of networks in the strategy process, relevant recommendations for action and statements from expert councils and stakeholder forums were also included in the analysis. Additional information was taken from internet sources, which primarily included information portals of the Federal Government and its strategy processes as well as websites of the offices of the networks and committees under consideration.

In addition to a document analysis, a number of semi-structured interviews with experts were carried out for this study. A semi-structured interview is understood here as an interview that is carried out with the help of a guideline, from which the interviewee may deviate or individual questions can be supplemented or deepened by the interviewer. With the help of the semi-structured expert interviews, additional, often informal knowledge could be acquired.

A total of 22 experts were asked about the selected strategies. In order to identify people with specialist expertise, the lead federal departments and the responsible departments were determined on the basis of the strategy papers or the publicly accessible organisation charts of the federal departments. In addition to the people directly involved in the strategy process, those people who accompany or observe a strategy process were also defined as experts. In addition to the federal departments involved in the strategy process, individuals from the networks and committees involved were also contacted. This included, among other things, chairpersons of the networks or committees as well as the management of the responsible offices. In addition, authors of progress reports or accompanying scientific research were included in the contact database created as part of the contact research. This procedure resulted in a database with over 60 contacts, of which 22 experts could be interviewed for this analysis.

In order to be able to carry out the interviews as efficiently as possible, a guideline for the semi-structured expert interviews was developed, created and tested in advance of the analysis. The guidelines for the interviews followed the three main areas of analysis (1) selection and prioritisation of policy instruments, (2) expert councils and stakeholder committees and (3) non-continuous formats for involving stakeholders and the public. After conducting the pilot interviews, the guide was revised. For example, the concept of the strategy process was more clearly defined as the process of developing, implementing and updating a strategy. In addition to the document analysis, additional practical knowledge about the strategy processes could be generated with the help of the guide through the semi-structured interviews and was included in the analysis.

3.2 Analysis results

3.2.1 Analysis point 1: Selection of measures and structuring of strategy processes

A central component of the DAS process and its further development is the procedure for selecting and defining concrete political measures for climate adaptation, which are recorded in the form of the APA. Such a process can include the evaluation and prioritisation of measures. As part of the APA process, such a prioritisation has not yet taken place, i.e. in the sense of a criteria-based evaluation process with the subsequent prioritisation of instruments based on their evaluation. At the beginning of the APA process, the Federal Government declared that prioritisation can only take place after a vulnerability analysis for Germany is available (The Federal Government 2011 in Hustedt 2014). While the APA II fulfils this condition, the measures included in APA II were not selected and prioritised according to fixed criteria. The evaluation report for the DAS also highlights a need for improvement in the coordination regarding the selection of policy instruments and measures of the APA II, which up to now has not been very systematic (Gaus et al. 2019). The lack of a more concrete target system was also criticised. For these reasons, the aim of this analysis point was to illuminate the selection of policy instruments and measures in other departmental and cross-level strategies of the Federal Government in order to record possible learning effects for the improvement of the procedural proposal for policy instruments and measures of the Network of Authorities for Climate Change and Adaptation as well as the updating process of the DAS. In addition, different formats of controlling and structuring of strategies were examined, including how these can lead to an improved definition of goals of strategies and action plans.

3.2.1.1 Selection and determination of measures

It is possible to draw a number of conclusions from the examined strategy and action planning processes, namely how such a process typically proceeds, which actors are involved and how action plans are formulated. Particularly in the early phases of strategy formation, an action plan is created primarily by asking the departments involved for suitable measures. This is often an inventory of already planned or existing measures that are assigned to the action fields of the strategy. While stakeholder involvement is usually present in this type of process, it is limited. Stakeholder participation takes place here primarily through the submission of statements and comments on drafts by the department responsible for the strategy. Sending working drafts of strategy papers for comment by various stakeholders with subsequent revision by the responsible department is a widespread procedure within the framework of national political strategies in Germany. Such a process was carried out, among other things, in the preparation of

the second National Action Plan for the Implementation of the UN Convention on the Rights of Persons with Disabilities (UNBRK) (Bundesministerium für Arbeit und Soziales (BMAS) 2016). Here, the BMAS drafted a text that was presented as a working draft and on which comments could be submitted. Based on this feedback, the draft was revised and finally discussed in a new form at a dialogue event.

The formulation of action plans based on empirical inventories is also widespread. Relevant action fields are then derived from such assessments of the initial situation. This approach is also reflected in German adaptation policy. The Adaptation Action Plan from 2015, adopted as part of the progress report, was drawn up on the basis of the 2015 vulnerability analysis and is divided into clusters and action fields based on the determined climate impacts (The Federal Government 2015).

It should be clearly emphasised that in all of these procedures, which can be described as typical, the final selection and determination of measures took place as a negotiation between the departments involved. The decision-making bodies can be located at different levels, for example in the form of an interministerial working group (IMA) or a committee of state secretaries. This "classic" approach has various characteristics typical of the German administrative and governmental apparatus. Central to this is the departmental thinking of the Federal Government. Individual representatives act and make decisions according to the logic of their own department. Although the procedure usually includes the participation of and dialogue with various stakeholders, this takes a limited and mostly unstable form. The activities of the departments are coordinated with other actors, but primarily in a support role, i.e. they are not shaped in a centralised manner. The result is often a compilation of proposed measures from different departments that are only partially coordinated and reflected upon with stakeholders.

The central deficit of this procedure: such a collection of instruments and measures often exhibits a low level of coherence and the measures often contain a widely varying level of detail. In addition, this approach usually results in long lists of measures that are not prioritised. This can lead to confusion and the limited accessibility of action plans, as well as the sub-optimal prioritisation of their implementation. In these cases, one cannot speak of a coherent policy mix, but only of a mix of instruments.

The initial strategy process of the DAS, as described at the beginning, can also be classified in the description of this typical procedure. The development of the action plans is accompanied by a dialogue process with the federal states, municipalities, academia and other social actors. For example, the federal states can comment on the Standing Committee on Climate Change Adaptation (StA AFK) set up by the Conference of Environment Ministers, which is part of the Federal-state Working Group on Climate, Energy, Mobility and Sustainability (BLAG KliNa). In addition, the network of authorities developed a proposal for suitable instruments and combinations of instruments as part of the update process for APA III (Hetz et al. 2019).

3.2.1.1.1 Innovative approaches

In addition to these approaches to action planning and the definition of measures, which can be described as typical or classic, there are some indications of innovative and integrative methods of different strategies that also offer valuable indications for the further development of the action planning of the DAS and the work of the network of authorities. On the one hand, the identified approaches are characterised by extensive and intensive involvement of a wide range of stakeholders. This involvement can take place at the beginning of the strategy formulation process and provide important preparation for the work of the departments to create action plans, as well as being a central component of the action planning process itself. For example, so-

called implementation workshops were held as part of the ProgRess resource efficiency strategy, which served to prepare for the creation of a catalogue of measures. In addition to experts from the departments, various stakeholders, including members of the stakeholder platform NaRess (National Platform for Resource Efficiency), and other experts took part (Jacob et al. 2019). A total of around 20 to 30 people participated in the workshops, which were based on various key topics. These workshops explored which instruments are needed and whether previous measures are having a satisfactory effect or should be supplemented. The results were then presented to the departments in preparation for drawing up action plans. According to the experts, this process was viewed by all those involved as critical preparatory work and assistance.

The Mobility and Fuel Strategy

One example of comprehensive involvement of stakeholders in all phases of the strategy process took place within the framework of the Mobility and Fuel Strategy (MKS). First of all, a preliminary study was commissioned, which included, among other things, a survey of expectations for the specialist dialogue to be carried out in science, business and interest groups; recommendations were formulated for the development of the MKS. Numerous stakeholders were then involved in the strategy development process as part of a specialist dialogue that lasted several months. This dialogue for developing the strategy consisted of a number of events in different formats, including workshop talks in the preliminary phase, workshops to clarify facts in a first working phase, and technical discussions to deepen particularly complex issues in a second working phase. In a third phase, workshops were held in which the participants developed concrete recommendations for action. In addition, a practical dialogue was carried out with citizens; this process explored the results of the specialist dialogue from the experience as mobility users. As a result of this extensive dialogue, an informal network of actors was established that continued to play a role in the further strategy process.

Another form of an integrative approach to formulating action plans involves the joint development of measures by various stakeholders in cooperation with the departments. In this case, measures are defined and decided in joint technical working groups.

The National Integration Action Plan

For the further development of the National Integration Action Plan (NAP-I), the plan was initially structured according to different phases of immigration instead of specific action fields. This structuring arose from the realisation that different needs exist in the various phases of immigration and coexistence. A total of 24 subject areas were assigned to these phases. Technical working groups were set up for each of these areas; these groups were tasked with developing up to five core projects. This takes care of the mandate from the current coalition agreement to bundle the diverse integration measures in a nationwide strategy based on the principle of "regulate and support". The content of the topic groups is processed by a leading department with the participation of the federal states, municipalities and civil society. The involvement of migrant organisations is obligatory. The responsible institution, a time frame and indicator(s) for checking the achievement of goals is to be defined for each core project. The Federal Chancellery, which is responsible for NAP-I, specified the form of participation and the definition of the goal with the formulation of core projects. The results of the working group process will be presented at the upcoming integration summits in the form of a thematic report. The reporting structure and the number of core projects to be developed are also specified. These projects must represent new activities and not a relaunch of existing projects. According to experts, these clear guidelines are important to ensure that every ministry has an interest in the success of "its" topic forums. Instead

of the previous 350-page action plan, which consisted of long tables with technical key data of the individual measures, the optimisation of the NAP is meant to concentrate on central projects. The entire process is coordinated by the Federal Government Commissioner for Migration, Refugees and Integration. In this way, the NAP-I is moving away from the classic catalogue of individual measures to a structure based on focused core projects for various subject areas. This very precisely defined approach with clear specifications regarding the results to be achieved was described by experts as ground-breaking.

Another starting point for innovative processes identified in the analysis consists of approaches to overcoming departmental thinking in order to arrive at an overarching, coordinated approach. The process for developing the implementation strategy for digitisation can serve as an example here. Design thinking workshops took place with representatives of the departments under the direction of the Federal Chancellery, which, according to participants, were viewed as very constructive. As part of the workshops, those involved were motivated to discard their departmental perspective and arrive at a higher-level view. An external coordinator was present at all workshops to establish the appropriate "flying altitude". At the same time, they made sure that those involved did not fall back into the role model of their departments. Since adaptation to climate change is a complex policy problem that can only be addressed through cooperation between the relevant departments, such an approach represents an option for optimising the APA process in order to achieve an overarching perspective and transfer this to the action planning process.

Various characteristics can be derived from the approaches described, which characterise an innovative and integrative approach. This includes extensive involvement of a wide range of stakeholders, an overarching approach and a focus on key issues rather than a long list of collected actions. Such an approach can address the various weaknesses of a classic method. The strong involvement of stakeholders and the resulting preparatory work for the selection of measures can facilitate their subsequent implementation and increase the quality of the catalogue of measures. Since various relevant perspectives are brought in by stakeholders involved in the implementation of measures from the outset, possible obstacles are identified at an early stage and practical, relevant measures are developed. In addition, expertise is bundled in specialist working groups, which offers the developed action plans a broader informational basis. Focusing on core projects, as in the case of the NAP-I, increases the visibility of the action plan and the individual projects. This achieves focus as opposed to a long list of suggested measures. The definition of responsibilities, schedules and indicators of success also enables clear verifiability of the implementation.

3.2.1.1.2 Evaluation of measures

One aspect that was particularly relevant for the analysis was the evaluation of measures before they were included in a catalogue. The main question was whether a selection of measures was based on a structured evaluation. Despite intensive research, however, only a few completed evaluation processes could be identified.

Nevertheless, a number of frequently used evaluation criteria could be identified in these analysed strategies. This includes

- The implementation costs of a measure, defined as the costs of implementation, and, if necessary, monitoring. These costs are incurred either by the enforcement authority or by

the users, for example due to reporting obligations or application procedures, and can have a major impact on the implementation or use of an instrument.

- Macroeconomic effects, especially consumption, structure, distribution and employment impacts
- Obstacles and factors preventing the implementation of the measure
- Possible distribution effects between different regions
- Increasing the share of private investment
- Interactions with existing measures
- Effectiveness, efficiency and scope
- Administrative feasibility
- Static and dynamic efficiency: For static efficiency, whether or not the instrument addresses the relevant deficit at the lowest possible cost and achieves the greatest possible effect is decisive. The extent to which incentives are created for continuous improvement is pivotal for the dynamic efficiency of a measure.

In most of the cases examined, the different criteria were subjected to a qualitative assessment. A quantitative assessment was only carried out in individual cases. In the foreground of most evaluation procedures was the determination of the effectiveness of the measures. Depending on the process, the basis for the evaluation of instruments and measures was either assessments by experts involved in the process or current studies and results of earlier, associated research projects. Practical experience with an instrument, which was gained abroad or at regional level, for example, was also included in the evaluation as an indication of the effectiveness and feasibility of an instrument.

Some of the evaluations carried out took place as part of associated academic projects, as part of a recommendation from an associated committee, or to set priorities for instruments. The procedures used included the written evaluation by experts in a multi-stage procedure, as in the case of the Bioeconomy Council in preparing recommendation for the BMEL. In some events, the evaluation of proposed measures was also discussed and a joint evaluation was developed. This procedure was used as part of the implementation workshops to accompany the ProgRess resource efficiency strategy. Here, suggestions for instruments were discussed and evaluated by experts and members of the stakeholder platforms, i.e. National Platform Resource Efficiency (NaRess) and Resource Efficiency Network (NeRess). An evaluation using online questionnaires is also a common procedure.

Despite the small number of evaluation methods examined, individual indications of key success factors and beneficial procedures can be identified. It was rated as helpful to provide the participants with key questions for the classification of evaluation criteria, in addition to the definitions of those criteria. With regard to dealing with divergent assessments of instruments by experts involved in the process, the analysis results in different approaches. One way is to average the ratings. Alternatively, it is possible to explore why the evaluations are different, for example as a result of varying preferences or different levels of knowledge. This makes it possible to achieve a mutual result in a discussion.

The effectiveness of the clear specification of criteria for the selection or evaluation of instruments was assessed differently. While some experts saw specific criteria as a helpful guideline to get away from a pure negotiation process for selecting measures, others saw this as only partially useful. According to the latter, critical view, a standardised procedure with fixed criteria is difficult to implement because there are many possible criteria and numerous different perspectives. Instead, it was considered more appropriate to view policy definition as an iterative process, one that aims to bring together all stakeholders and achieve agreement.

The National Action Plan on Energy Efficiency

In the case of the National Action Plan on Energy Efficiency (NAPE), measures were evaluated as part of an associated academic project. At the beginning of the action planning process, an effectiveness assessment of the proposed instruments took place. Here, the quantitative, energy-saving effects of the measures were estimated in reports on individual sectors. This was based on the most recent studies available. Accordingly, those measures that can exploit the savings potential identified in the various sectors were selected. A quantitative and qualitative assessment was then carried out for the selected instruments. For the quantitative evaluation, in addition to an estimation of the savings effects of the measure, the costs were also considered, taking into account the energy costs saved, the funds required for the implementation of the measure and the additional investments required (Schlomann et al. 2014). The qualitative assessment was based on the criteria of macroeconomic effects (consumption, structural and employment effects) as well as existing obstacles or factors standing in the way of the implementation. Other criteria taken into account were possible distributional effects, increasing the share of private investments in highly efficient technologies, securing savings targets that are as long-term as possible, and interactions with existing measures. These criteria were evaluated on the basis of analyses in previous projects and the assessment of experts involved in the project (Schlomann et al. 2014).

All of the evaluation criteria and methods examined in the context of the various strategies can be applied to individual policy instruments and measures, but do not include the overall view of a policy mix. The same can also be said for the evaluation of measures within the framework of the Network of Authorities for Climate Change and Adaptation and represents a limitation of the current evaluation process.

From the explanations presented here, it is possible to derive information for the work of the Network of Authorities for Climate Change and Adaptation and, in particular, for the evaluation of adaptation measures. Evaluation criteria that can be considered for a new procedure include the administrative feasibility of measures, factors opposing the measures and possible macroeconomic effects. The discussion of deviating assessments, which experts classify as sensible and helpful, has already taken place in the past within the framework of network meetings. The provision of guiding questions to rank the evaluation criteria may be a useful improvement to the process. In contrast to the previous procedure of the network of authorities, hardly any coherence and synergy criteria were included in the evaluation of individual measures in the strategies examined. According to experts, these criteria are difficult to apply to individual measures, since the coherence criterion in particular relates to the entirety of the measures or the catalogue of measures. Individual experts interviewed could only make a limited assessment of this, since a higher-level perspective is required. This limitation should be taken into account in a new evaluation process within the network of authorities.

3.2.1.1.3 Prioritisation of measures

At various points in the analysis, it became clear that a prioritisation of measures is seen as sensible and desirable. In the evaluation of the resource efficiency strategy, the risk of "expenditure in rather small-scale individual measures" is also pointed out (Bahn-Walkowiak et al. 2019), the effect of which is difficult to measure and which is associated with a confusing distribution of responsibilities. Nevertheless, the vast majority of strategies and action plans examined do not contain any explicit prioritisation. The political importance assigned to a specific measure may result in an implicit prioritisation – this is made clear, for example, by the budget funds available to a measure. If a measure is underpinned by a high budget in a department, it has a high priority. For the analysis carried out here, however, only explicit prioritisations that were part of a selection process were relevant.

The prioritisation process in the Bioeconomy Council

The recommendation of the Bioeconomy Council to the BMEL regarding the optimisation of the bioeconomy policy strategy contained an explicit prioritisation of measures. The criteria for this prioritisation were defined by the Council; the procedure was carried out at the request of the Ministry. Both the action fields and the measures were evaluated and prioritised. The criteria used included the short and medium-term implementation/feasibility in this legislative period, economic effects (competitiveness, jobs, economic growth), ecological effects (sustainable change, nature and environmental protection aspects) and the social importance/participation of a measure. Based on these criteria, the Council held two rounds of voting. The three most important action fields were determined in an initial survey. In the second round of voting, all measures of the political strategy were evaluated. Both were based on the criteria described above. The 17 measures with a particularly high number of votes were passed on as a priority. This recommendation was, according to the progress report (Bundesministerium für Ernährung und Landwirtschaft (BMEL) 2016), taken up by the Federal Government and assigned greater importance in the progress report.

Such a prioritisation procedure is an exception in the current strategy landscape. An explicit prioritisation based on assessments by experts and using clearly defined criteria can provide clear assistance in the implementation of a detailed catalogue of measures such as the APA. Priority requirements for action in adapting to climate change could already be derived from the vulnerability analysis of 2015, but so far have not led to a clear prioritisation or implementation of associated measures. A procedure similar to that of the Bioeconomy Council could be carried out within the Network of Authorities for Climate Change and Adaptation. This would contribute to the prioritisation of adaptation measures.

A simplified evaluation and prioritisation method, which was examined as part of this analysis, had the aim of developing a selection of professionally recommended instruments and of identifying instruments that appear promising but still require further investigation due to gaps in knowledge. This distinction between instruments for which the knowledge required for design and impact assessment is available and those that should be subjected to further investigation represents a further starting point for prioritisation. For the implementation of this procedure, the participants were presented with a list of suggested instruments with associated brief descriptions. The various instruments were then evaluated with the help of an online questionnaire. The first question asked was whether there was sufficient knowledge about the instrument. If the answer was yes, the evaluation of the effectiveness and consistency of the instrument was then requested. If both properties were considered to be present, the instrument was listed as a priority. If the initial question about the level of knowledge regarding

the instrument was answered negatively, questions about the evaluation of the effectiveness and consistency of the instrument also followed. If these were answered positively, the instrument was recommended for a policy impact assessment. Participants also received definitions for the terms “knowledge”, “effectiveness” and “consistency” as well as key questions for the assessment process.

In contrast, the definition of key measures can bring important priority activities to the fore even without a detailed evaluation and prioritisation process. This in no way precludes pursuing further, subordinate measures. This procedure can be seen in the development of core projects as part of the update of the NAP-I. The definition of core projects represents a prioritisation method that formulates critical, clearly defined projects that require rapid implementation – instead of a long list of measures.

Table 19: Overview of examined strategies and characteristics

	NAP Integration	Mobility and Fuel Strategy	NAP Business and Human Rights	Bioeconomy Policy Strategy	Digitisation Implementation Strategy	NAP Energy Efficiency
Process for selecting measures	Intensive consultation in working groups (taking stock, setting goals, formulating measures)	Development of concrete recommendations for action at workshops	Collection of measures through specialist events and subsequent consolidation on core topics	Selection of measures by departments	Design thinking workshops to overcome departmental perspectives	Collection of measures in platforms and subsequent participant consultation
Involvement of stakeholders	Dialogue process (forums)	Series of events with specialist dialogues (on-site discussions, workshops, technical talks), practical dialogues	Multi-stakeholder meeting and specialist events on a subject	Bioeconomy Council as an advisory body	Online participation portal for the consultation process	Energy transition platforms
Stakeholders involved	Participation of federal states, municipalities and civil society (including migrant organisations)	Representatives of business, science, civil society, randomly selected citizens	Representatives of business, politics, civil society, associations and science	Experts from business, science and society	Representatives of politics, business, science and society, interested citizens	Representatives of business, civil society and science as well as the federal states
Evaluation of measures	No	No	No	Based on assessments by experts, determination of action fields and evaluation of measures through voting rounds in the Bioeconomy Council	No	Carried out by a scientific consortium, based on studies and assessments by experts
Evaluation criteria				Short and medium-term implementation/feasibili		Energy saving effects, implementation costs,

	NAP Integration	Mobility and Fuel Strategy	NAP Business and Human Rights	Bioeconomy Policy Strategy	Digitisation Implementation Strategy	NAP Energy Efficiency
				ty in the legislative period, economic impact (competitiveness, jobs, economic growth), ecological impact (sustainable change, nature and environmental protection aspects), social significance/participation of a measure		induced additional investments Overall economic effects (consumption, structural and employment effects), existing obstacles Possible distributional effects, increasing the share of private investments in highly efficient technologies, securing savings targets that are as long-term as possible, interactions with existing measures
Prioritisation	Formulation of core projects represents the prioritisation process	Prioritisation of goals	No formal prioritisation	Prioritisation of action fields and measures		Time prioritisation (short, medium and long term)

3.2.1.2 Control, structuring and goal-setting for strategies

The process of selecting and defining concrete measures is a central part of implementing a strategy. The course of this process is primarily designed by the responsible control body. The control and structuring of a strategy depends on how pronounced the cross-departmental cooperation is, whether interactions between different action fields are taken into account and whether there is a clear goal orientation in the implementation process. A lack of goal definition was criticised in some of the examined strategy processes; participants noted the associated difficulty in monitoring progress. In the context of the DAS, a less concrete target system and difficulties in interdepartmental cooperation were cited as points of criticism. The procedures of the analysed strategies therefore provide important information for the potential improvement of the DAS process.

3.2.1.2.1 Control and leadership

The core of all examined strategy processes is the work of the department in charge and the decision-making by the departments involved. In almost all of the strategies examined, reference was made to the importance of cross-departmental cooperation, often through the establishment of an IMA. A typical approach is to identify a coordinating unit within a department that will lead the strategy and action planning process. Overarching committees, such as an IMC or a committee of state secretaries, are then set up for the coordination and decision-making of the departments involved. In general, the process for developing an action plan is structured by the lead authority and a schedule is developed in consultation with the departments. The leadership collects the contributions of the departments, takes the necessary votes and then gives the result to the decision-making body. The departmental coordination group and the decision-making body can be set up at different levels.

The contact points/focal points of the ministries involved can also be located at different levels. According to experts, the hierarchy can be used to structure the coordination function, increasing the importance of the process. The high political importance of the German Sustainability Strategy, for example, is made clear by its leadership and coordination bodies. Ongoing coordination takes place in a working group at the level of the sub-department heads, in which all departments are involved under the leadership of the Federal Chancellery.

National focal points

Numerous interviewed experts considered a national focal point with a cross-departmental function as useful. This is the case, for example, in the implementation of the UNCRPD by the Federal Government Commissioner for Matters Relating to Persons with Disabilities. Although the BMAS is in charge of the action plan, which coordinates the process, works with the departments and is responsible for the implementation of cross-departmental measures, the Federal Government Commissioner nevertheless has an important overriding function. They monitor ongoing activities and, if necessary, report concerns to the relevant stakeholders. Since this person is not dependent on instructions, they have an important overarching function. The commissioner ensures the involvement of civil society and relevant actors in the implementation process and is the interface between civil society and the state level.

The cross-departmental function of federal commissioners can also be shown using the example of the work on the NAP Integration. Here, the highest-level steering committee consists of a group of state secretaries – who only met at the beginning of the process to approve the concept for the

development of the new action plan, however. In all twenty-four thematic forums of the process, the Federal Government's Commissioner for Integration is represented by an advisor, who acts as overall coordinator. In internal meetings, there is regular exchange and overlaps in the topic forums are discussed. Such an approach can make a major contribution to the overall coordination of an action plan and its coherence.

In the context of the expert interviews, it was considered valuable to establish coordination between the departments at different levels. On the one hand, coordination at the working level with the technically competent individuals plus an additional committee at the level of the sub-department heads or a higher level is therefore desirable in order to increase the status of the process.

While the creation of coherence is pointed out in many action planning processes, the implementation of this claim is often problematic. As part of the German Sustainability Strategy, for example, there is an obligation for the departments to appoint sustainability coordinators, if possible at the level of the head of department. These coordinate internal departmental activities related to sustainability and are intended to ensure a coherent approach by the Federal Government. However, such an approach is the exception.

Regular, ongoing exchange between an IMA and stakeholder groups was seen as a helpful part of the coordination process. The IMA Business and Human Rights meets every two months to monitor the implementation of the NAP. The business and human rights working group, a stakeholder forum with representatives from civil society and business, also meets every two months, offset from the IMA. The chair of this working group reports on the status at each IMA meeting, while the responsible Foreign Office reports on the work of the IMA at the working group meetings. This continuous and timely exchange is often viewed as very positive. Such close interaction and cooperation between a stakeholder forum and decision-making body ensures continuous coordination and enables constant feedback and the co-production of proposed measures and monitoring of the NAP implementation.

3.2.1.2.2 Structuring and goal definition

Typically, a political strategy and action plans are structured along a number of thematic action fields, with associated political measures. There are only limited interactions between these action fields. Overarching activities are often listed in a separate action field. According to experts, however, the clustering of cross-cutting issues in separate action fields can result in these topics not being considered in all other action fields.

Although this type of structuring can cover the main content-related action field, it has the disadvantage that, during implementation, there are usually dividing lines between the actors and activities of the different topics, so that there is only limited coordination or bundling of initiatives. In most cases, there is a lack of an overarching objective, which would provide a clear framework. A lack of such a clearly defined goal was listed as a point of criticism in the context of the DAS evaluation (Gaus et al. 2019). Individual strategies are attempting to break new ground here and to achieve greater bundling of activities and stakeholders through innovative types of structuring and strategy goal-setting. The efforts to be implemented are given a common direction by means of the core goals of a strategy, which are often jointly developed.

In some strategies, a goal is defined in several stages. Various guiding principles were developed for the implementation of the bioeconomy policy strategy, which give the strategy a conceptual framework and specify the basic framework conditions to be observed when implementing the

strategy. Based on these guiding principles, strategic approaches were formulated in the individual action fields, each of which is underpinned by concrete measures (Bundesministerium für Ernährung und Landwirtschaft (BMEL) 2014). More than one strategic approach could be assigned to each action field. The development of the guiding principles was carried out by the leading BMEL in coordination with the departments involved, based on recommendations of the Bioeconomy Council and aligned with the sustainability goals of the Federal Government (BMEL, 2014). The aim of this approach was, among other things, to achieve the implementation of the core goals of the bioeconomy strategy by disseminating the guiding principles in the work of all departments. Accordingly, the success of the strategy should not be measured by the implementation of individual measures, but by the extent to which the guiding principles found their way into the policies of the various departments.

A similar methodology was chosen for the Digitisation Implementation Strategy: key statements for the various action fields were formulated. According to experts, this represented an attempt to cluster the content more clearly in a thematic sense and to increase readability and accessibility. The target images were formulated in a workshop through intensive discussion between the departments. The finalisation was then carried out by the responsible Federal Chancellery.

The High-Tech Strategy 2025

The structuring of the High-Tech Strategy 2025 (HTS), which is based on missions, offers an innovative approach. The twelve formulated missions are intended to represent a connecting component of the initiatives of the HTS and were formulated in those areas in which a "bundling of all relevant actors behind a common goal is necessary in order to achieve further progress". (Bundesministerium für Bildung und Forschung (BMBF) 2019). With this mission-oriented approach, the activities of the departments and relevant actors from science, civil society and business are brought together and bundled behind the missions. The aim is to increase innovation dynamics and to implement research results in practice in a targeted manner. The missions are also intended to ensure that research and innovation are focused on overcoming urgent societal challenges. In order to strengthen cross-departmental cooperation, the missions have a higher priority and are headed by one or more responsible departments. While the missions are geared towards the long term, there are milestones and intermediate goals for the initial implementation period.

According to experts, this approach represents an effective optimisation of the strategy process. When formulating the missions, it was possible to identify which actors could contribute through which activities. Since several departments are involved in the implementation, there are points of contact with their respective stakeholder networks. The clear objectives of the missions provide orientation for the various activities. At the same time, a comparatively small number of missions establish a focus and consolidate the numerous government initiatives. According to experts, the experience with this approach has been positive.

The procedures described here for the structuring and formulation of goals in strategies allow the activities of the relevant actors at different levels to be bundled, which is extremely beneficial for the implementation process. The involvement of a large number of stakeholders, in turn, requires clear specifications to ensure that the various activities are aimed in the desired direction. Various initiatives and levels can be linked behind a mission or a guiding principle, which is essential for the implementation of effective and coordinated measures. In addition, a stronger external impact is created through improved accessibility of the strategies and the focus of activities on their core goals. The strategic orientation can be clearly recorded and

improved steering of the implementation can be achieved. Another important advantage of such an approach is that the implementation of a strategy's core goals can be achieved by incorporating the ideas or missions into the broader government work. The totality of these aspects means that such an approach is a clear strategic advancement that increases the level of ambition of a strategy.

Table 20: Overview of examined strategies and characteristics 2

	NAP Integration	NAP Business and Human Rights	Bioeconomy Policy Strategy	Digitisation Implementation Strategy	High-Tech Strategy 2025
Leadership	Federal Government (coordinated by the Federal Government Commissioner for Migration, Refugees and Integration)	Foreign Office (AA)	Federal Ministry of Food and Agriculture (BMEL)	Federal Chancellery (Federal Commissioner for Digitisation)	Federal Ministry of Education and Research
Voting or steering committee	Round of state secretaries: central steering committee	Interministerial Working Group (IMA) on Business and Human Rights Members: 10 ministries and the Federal Chancellery with observer status	Interministerial working group	Cabinet Committee Digitisation: highest political level Members: Federal Chancellor, all Federal Ministers, Minister of State for Digitisation, Federal Commissioner for Culture and Media, Head of the Press and Information Office	Internal government steering by a group of state secretaries from all departments involved (all ministries)
Rotation of meetings	Every two months			No predetermined meeting cycle	
Task	Coordination within the Federal Government	Review of implementation measures, further development of the process	Monitoring the implementation of the strategy	Preparation of federal cabinet decisions	Definition, control and design of the agendas along the focal points, picking up on momentum and ideas (including the High-Tech Forum)

	NAP Integration	NAP Business and Human Rights	Bioeconomy Policy Strategy	Digitisation Implementation Strategy	High-Tech Strategy 2025
Procedure	Implementation of 24 topic forums under the responsibility of the responsible federal ministries; area of responsibility for integration at federal AND state level	Management of the IMA: AA Input from: (external) status quo report (from expert interviews) Plenary conferences during consultation phase Final coordination phase with other federal ministries The CSR forum plays a supporting role and provides recommendations for action		Preparatory coordination round of state secretaries	
Structuring of the strategy	Structure along five phases of immigration, each with assigned thematic areas	Structure of action fields along three pillars of the UN Guiding Principles	Three cross-sectional and five thematic action fields. Overarching guiding principles, strategic approaches and measures	Seven thematic action fields	Three areas with 12 missions
Goal definition	Clear targets for formulating core projects (responsibility, schedule, indicators)	UN Guiding Principles	Goals and guiding principles (to avoid conflicting goals)	Key statements for each action field	Long-term missions with overarching social and technological goals

3.2.1.3 Starting points for the transfer to the German adaptation strategy

The analysed selection processes for measures result in various indications for optimising the action planning process and the work of the Network of Authorities for Climate Change and Adaptation. The permanent involvement of a larger range of stakeholders is an essential factor for an optimised foundation for the APA. If necessary, this could be achieved by expanding the network of authorities to include relevant stakeholders. Alternatively, another committee could supplement the network. The joint development of proposals for measures ensures the usefulness of the measures that end up accepted.

In the strategies examined, the prioritisation of measures is only part of the action planning process in exceptional cases. If there is any prioritisation, it is only part of a recommendation or takes the form of a temporal prioritisation of measures to be implemented immediately. Various methods are suitable for a prioritisation process for the network of authorities. On the one hand, a simplified prioritisation procedure, as described in Section 3.1.1.3, would be an option with little additional effort. Alternatively, all members of the network can receive a specified number of points. They can then award those points to measures, and the measures with the highest number of points become priorities. In addition, the development of a limited number of clearly defined core projects represents an alternative approach for prioritising and focusing activities.

An explicit evaluation of instruments can only be found in a few strategies. However, the criteria used in the few case studies do provide some indications of possible factors that are suitable for evaluating climate adaptation measures. In particular, the criteria of administrative or other obstacles as well as implementation costs of a measure are suitable for an evaluation of adaptation instruments. The consideration of macroeconomic effects can also be part of such an assessment, not least because political resistance is often attached to these effects. A helpful addition to the evaluation criteria is the provision of key questions that guide the network members when classifying criteria.

In addition, this analysis also identified the key success factors for an evaluation process. These include primarily the transparency of the procedure and the methodology from the beginning of the process. A common, uniform understanding of the evaluation criteria is also key. These basic requirements should be ensured in a new evaluation procedure in the context of the APA process.

With regard to the management process of strategies and its importance for the development of a catalogue of measures, the analysis revealed that one of the most common challenges is ensuring the effective coordination of the individual measures and aligning the numerous activities in a targeted manner. In addition, interministerial competition often functions as an obstacle here. It also became clear that conflicting goals should be addressed earlier and synergies taken advantage of. These challenges, some of which are also present in the DAS process, can be met by realigning them along missions, guiding principles or core projects, as described on the previous pages. As already explained in Section 3.1.2.2, High-Tech Strategy 2025 developed a new approach based on the concept of joint missions in order to formulate common research priorities among the departments and bundle activities. Such a process needs good leadership and an early coordination process between the departments.

A strategic realignment along defined guiding principles and core goals is also an option for the further development of DAS. This would allow a bundling of activities and actors as well as the linking of different levels, specifically the levels of the federal states, municipalities and civil society. A clear definition of goals would promote the joint pursuit of these goals by the

stakeholders involved, which could develop dynamics of cooperation and achievement. This aspect was already addressed in the second DAS progress report and represents one of the three political priorities for the next phase of the DAS (The Federal Government 2020). There it was stated that the IMAA will formulate a vision for a climate-resilient Germany as well as specific and verifiable goals for climate adaptation.

3.2.2 Analysis point 2: Stable, institutionalised networks and advisory bodies

The strategy process for the DAS is accompanied by an institutionalised and permanent network mandated by the IMAA, the Network of Authorities for Climate Change and Adaptation. The task of the network is to support the technical input and coordination of scientific content of the central products of the DAS and the action planning process. For example, in the process of updating the DAS, a procedure for the selection and prioritisation of policy instruments for the APA was developed and a proposal for suitable policy instruments was submitted. Under the leadership of the UBA, the Network of Authorities for Climate Change and Adaptation, which meets twice a year, is supported organisationally and conceptually by a project consortium.

Based on the characteristics of the Network of Authorities for Climate Change and Adaptation, a network can be understood as the institutionalised and permanent involvement of actors – in contrast to selective, non-permanent forms of actor participation. The latter must be clearly distinguished from the bodies examined in this section and will be discussed in Chapter 3.2.3 in detail. The networks considered here are also not to be confused with administrative working groups such as the interministerial working groups.

In the context considered here, a network can be understood as an institutionalised and permanent informal association of actors that advises and/or accompanies a strategy process at federal level and an associated action planning process. Based on a literature analysis, various network typologies were considered in work package 3 of this project, which showed that the Network of Authorities for Climate Change and Adaptation cannot be clearly assigned to the definition of a governance network or that of an implementation network. For this reason, it should be considered as a mix both typologies.

The aim here is to analyse the role of institutionalised and established networks in further strategy processes of the Federal Government and identify optimisation potential for the Network of Authorities for Climate Change and Adaptation and the DAS. It is of particular interest how a possible further development of the network of authorities and a broad participation of actors in the APA process can be designed. Above all, Grothmann proposes the involvement of smaller municipalities, business, civil society actors and the unorganised population (Grothmann 2018). The experts interviewed as part of the DAS evaluation report also see potential for optimising the interaction between federal departments and science and research (Gaus et al. 2019). Based on the description of the Network of Authorities for Climate Change and Adaptation as a subject for comparison, further institutionalised and established networks are analysed below along the characteristics of composition, task, coordination and meetings, mandate and suspension, coordination process and outputs.

In order to establish a good level of comparability, an attempt was made to identify a network of federal authorities and institutions with a mandate similar to that of the Network of Authorities for Climate Change and Adaptation. However, even after extensive research, no such network could be found that is comparable in terms of composition and tasks. However, internal networks of authorities were identified that do not accompany a strategy process, but are nevertheless mentioned for the sake of completeness.

On the one hand there is the NExT network, a politically independent network which, under the auspices of the Federal Government Commissioner for Information Technology, connects public sector employees at federal, state and local level in order to develop and provide tools in the context of administrative digitisation. The network is coordinated by the office of a registered association, which is to be operated as a digital platform in the future. Members of the network exchange ideas in so-called workshops, which work on different topics and are coordinated by workshop leaders, who in turn are in contact with the network board and the office. The members of the association and selected guests meet twice a year to exchange information. The main difference between this network and the network of authorities is that, in addition to the federal level, state and local levels are also involved; there are various working groups that deal with individual topics.

Also worth mentioning here is the working group of departmental research institutions: More than 40 federal institutions with research tasks that are integrated into the business areas of individual federal ministries have joined forces. The aim of the network cooperation is an exchange of experience, quality assurance of scientific work and cooperation on general questions of departmental research. The network is coordinated by a board that is elected every two years and consists of a chair and representatives from other departments. Guidelines that were decided at the founding meeting determine the tasks and perception of the members, who are active on the basis of a position paper and the self-commitments contained therein. Cooperation within the network is based on mutual agreement. An interesting difference compared to the Network of Authorities for Climate Change and Adaptation is the existence of jointly developed guidelines and goals that provide a framework for cooperation within the network.

The institutionalised and established networks used here for the comparative analysis, which advise and/or accompany a strategy process, can be divided into two categories: (1) expert councils and (2) stakeholder forums. While the expert councils mainly serve to pool the knowledge of experts in order to make recommendations, in the second case the focus is on involving relevant stakeholders. Although the functions of the networks under consideration partially overlap, this differentiation helps to clarify the focus of the respective network work.

3.2.2.1 Expert councils

In general, there are a large number of scientific advisory bodies that advise the Federal Government's strategy processes. However, some of the scientific advisory bodies are not explicitly linked to a specific strategy process. The following section compares the Bioeconomy Council, the High-Tech Forum and the Council for Sustainable Development, using the example of the Network of Authorities for Climate Change and Adaptation.

Each of these expert councils was appointed to advise on a specific strategy, consist of a similar number of members and have a significantly lower number of members compared to the stakeholder forums. For example, the Council for Sustainable Development has 15 members, the Bioeconomy Council has 17 members and the High-Tech Forum has 21 members – each from academia and society. In the opinion of experts, a limited number of members is an important success factor for the work of an expert council, as this significantly facilitates the opinion-forming and decision-making process. In contrast to stakeholder forums, the members of the expert councils are mostly independent, voluntarily participating experts in specific fields. One interview emphasised the neutral role of the members, based solely on technical expertise, as a success factor in the joint work.

As a rule, the expert councils have the task of advising the Federal Government on certain strategy processes (based on research). The task of the Bioeconomy Council is, for example, to advise the Federal Government on the implementation of the National Bioeconomy Strategy. The expert councils mandated by a leading department or the Federal Government are coordinated with the help of an office, which is often run by an external sponsor. As a rule, the expert councils meet one to four times a year; topic-specific working groups also meeting at shorter intervals.

The work processes vary within the relatively similar tasks of the networks. In contrast to the Bioeconomy Council, in which the experts act as independent individuals, concrete recommendations for implementation and action in the High-Tech Forum or the Council for Sustainable Development were processed by topic teams and specialist working groups. In the High-Tech Forum, after voting within the topic teams, the papers that have been prepared are released for (specialised) public comment and the comments received are then discussed. The Council for Sustainable Development can also form working groups for specific topics and, if necessary, invite additional experts on a topic-related basis.

The High-Tech Forum

The High-Tech Forum was set up by the Federal Government as an advisory body for the implementation of the High-Tech Strategy 2025, with the advisory mandate being linked to the current legislative period. The High-Tech Forum has already published key recommendations for the implementation and improvement of the previous high-tech strategy. 21 experts from academia, business and society, appointed by the Federal Research Minister, make recommendations on specific key issues in the form of discussion papers. Because of the "learning" character of the High-Tech Strategy 2025, the expert council publishes discussion papers at regular intervals and can propose new topics for consultation. The current chairpersonship of the High-Tech Forum is shared by a state secretary from the Federal Ministry of Education and Research (BMBF) and the president of the Fraunhofer-Gesellschaft, which also houses the office of the High-Tech Forum. A classic advisory process of the High-Tech Forum, which aims to work as transparently as possible, looks like this: As soon as the High-Tech Forum has determined a topic based on the political discourse, they form a topic-specific working group that defines the need for action and draws up a discussion paper that addresses specific questions and problems. The working group determines how they are going to do the work. For example, they can consult other experts in workshops or interviews. A representative of the working group presents the first draft of the recommendations at a plenary session of the High-Tech Forum. The ideas are discussed and then consolidated, after which a draft of the discussion paper will be made available on the website for public comment. Both explicitly addressed stakeholders and the broader public are invited to comment. The comments collected are passed on to the plenary session of the High-Tech Forum and to the federal departments. In the round of state secretaries on the High-Tech Strategy 2025, the spokesperson of the working group will then present the recommendations and the comments received, as a result of which the departments can continue the work and initiate further activities. According to experts, setting up temporary, topic-specific working groups, which draw up recommendations on a specific issue with the involvement of other specialists, helps avoid specifications that are too narrow and circumvent the need for consensus in the committee. This makes decision-making easier. In addition, the comment round and the publication of the discussion paper can strengthen public relations, dialogue and transparency. Another advantage is the appointment of experts beyond the logic of representing the "usual suspects", which prevents entrenched and fixed positions.

According to the experts interviewed, it is also important to agree on how a network works together and how decisions are made. The Bioeconomy Council and the Council for Sustainable Development have, for example, drawn up rules of procedure in this context. In its rules of procedure, the Council for Sustainable Development has stipulated that decisions should be made by consensus if this is not possible using the majority principle. In the opinion of experts, formal or informal rules of procedure are of great relevance to ensure that the opinion-forming process runs smoothly. This sets out some basic ideas about the goals, working methods and quorum of the board. Informal rules of procedure can develop over time and through learning from previous collaboration within the board.

The Council for Sustainable Development

The Council for Sustainable Development is made up of 15 public figures and advises the Federal Government on sustainability policy. The aim of the committee is: a) to develop contributions for the implementation of the German Sustainability Strategy; b) to name concrete action fields and projects; and c) to make sustainability an important public concern (Rat für nachhaltige Entwicklung n.y.). The Council, which was mandated by the Federal Government, began working in 2001. The Council independently determines its topics and forms of action, for which budget funds are assigned. For the terms of office from 2010 – 2013, 2014 – 2016 and 2017 – 2019, the Council has drafted work programmes that are publicly available. The work programmes formulate political framework conditions, priority advisory services requested by the Federal Government, and working modalities of the Council. Sections on the structural reinforcement of the idea of sustainability, key political issues and communication tasks are also included. On 17 January 2020, rules of procedure for the Council were also adopted, which regulate formalities regarding tasks, chair, meetings and resolutions, Council bodies, minutes and publications, the Secretary General, as well as travel expenses and meeting allowances. For example, the rules of procedure provide for regular meetings, at least twice a year, and support via an office. The Council can also set up working groups to develop opinions. In order to be able to make decisions, at least two-thirds of the members have to vote; if consensus is not possible, decisions are made according to the majority principle. Activity reports that provide information on the work results of individual mandate periods are available on the website, as are the results themselves. The example of the Council for Sustainable Development illustrates what rules of procedure can look like, the relevance of which for successful network cooperation has been emphasised by experts in a formal or informal form.

Different outputs can arise from the tasks and coordination processes of the expert councils. Most of the expert councils and stakeholder forums develop statements, input and discussion papers, background papers and recommendations for action. In some cases, the expert councils also perform other tasks. For example, the Bioeconomy Council also organised a dialogue with the public, including a contribution to the Federal Government's open house, product exhibitions and an award ceremony. The Council for Sustainable Development supported the organisation of the peer reviews of the German Sustainability Strategy, the development of a sustainability code and the founding of a hub for sustainable finance – although it must be mentioned that the Council for Sustainable Development has a not inconsiderable, annually determined budget for the implementation of such activities.

A typical feature of the expert councils is a publicly accessible webpage that documents their work and communicates with the public. Especially with regard to the transparency and recognition of the work of the expert councils, which some of the experts surveyed classified as important factors for successful networking, this represents a way of communicating work results and developments in the strategy process – also with a broader (professional) public.

In summary, it can be stated that expert councils that advise and/or accompany the Federal Government's strategy processes have a manageable number of members who, as individuals with specialist expertise, were often appointed to the committee in a voluntary capacity by the Federal Government or individual departments. The expert councils mandated by the Federal Government or by individual departments are usually coordinated by an external office. The structure of the cooperation of the networks varies. The cooperation of some expert councils follows rules of procedure that define things like criteria for voting, e.g. the consensus or majority principle. Outputs from the expert councils primarily focus on background and recommendation papers, but some include other activities.

Table 21: Overview of the examined expert councils and characteristics

	Bioeconomy	High-Tech Forum	Council for Sustainable Development
Composition	17 members from research, business and society	21 members from academia and society	15 members from public life
Task	Advice on the Bioeconomy Strategy of the Federal Government	Recommendations for the High-Tech Strategy 2025	Developing contributions for the implementation of the German Sustainability Strategy, naming specific action fields and projects, and making sustainability a major public concern
Coordination and meetings	The Bioeconomy Council is supported by an office and meets four times a year	The High-Tech Forum is supported by an office and meets two to three times a year	The Council for Sustainable Development is supported by an office and meets three to four times a year
Mandate and associated bodies	Federal Ministry of Education and Research (BMBF) and Federal Ministry of Food and Agriculture (BMEL)	Federal Ministry of Education and Research (BMBF), advisory mandate linked to the legislative period	Federal Government
Voting process	The advice of the Bioeconomy Council takes the form of (a) recommendations that are supported by all council members and published after an external review process, and (b) background papers that are publicly available on its website	Cooperation in topic teams with defined coordination processes The work results of the topic team are presented at a meeting of the High-Tech Forum, then released for (specialist) public comment and finally published in the form of a discussion paper	Agreement based on consensus, if not possible based on majority rule
Outputs	Statements, recommendation papers, background papers, dialogue with society	Discussion papers	German Sustainability Code, statements on the German Sustainability Strategy and other topics related to sustainability policy, establishment of the Hub for Sustainable Finance, nationwide networking of stakeholders through RENN (Regional Network Offices for Sustainability Strategies), funding of national sustainability projects via the Sustainability Culture Fund, strategy dialogue on sustainable urban development and contributions to sustainable economies

3.2.2.2 Stakeholder forums

In addition to expert councils, other Federal Government strategies are accompanied by stakeholder forums, which differ from the expert councils in particular in terms of their composition and tasks. Classically, as in the DAS strategy process, a draft of a strategy paper is sent to interest groups within the framework of stakeholder participation, who can take the opportunity to comment on the draft strategy. Other actors such as federal authorities and

institutions, states or municipalities are usually involved in strategy processes, for example in the form of federal-state working groups. The establishment of stakeholder forums represents a way of institutionalising and consolidating the involvement of and coordination with relevant actors.

With regard to the composition of the networks, the stakeholder forums differ from the expert councils in that a larger number of actors are represented and participation is linked to the organisation, and not to individuals. The Energy Transition Platform Energy Efficiency, which supports the strategy process of the National Action Plan on Energy Efficiency, brings together 40 to 70 relevant stakeholders from business, civil society, and academia along with the relevant departments and federal states. The National Resource Efficiency Platform and the Business and Human Rights Working Group of the CSR Forum also have around 40 participants. The number of participants in the stakeholder forums, who are invited by the responsible departments, is therefore twice as high as that of the expert councils.

In the policy areas of demography and integration, topic-specific working groups are used to involve stakeholders in the strategy process. In the political field of demography, the Federal Government, states, municipalities, social partners, associations, business, academia and civil society have been collaborating in working groups since the first demography summit in 2012. The parties discuss and further develop selected topics of the demography strategy. The size of the working groups varies, but on average around 20 actors are represented in the groups; in addition to stakeholders, they also include departments, authorities and institutions.

The stakeholder forums vary in terms of their task, because they are involved in the development as well as the improvement and/or implementation of the respective strategy. While the Energy Transition Platform Energy Efficiency, the National Platform for Resource Efficiency and the Business and Human Rights Working Group are primarily used for mutual exchange and information, the working groups in the strategy processes for the political fields of demography and integration are involved in the design of the strategy process, for example in the concrete development of core project.

In order to reduce the number of participants within a stakeholder forum, topic-specific working groups can be established within a network. Jacob et al. (2019) recommend this for the further development of the National Resource Efficiency Platform; in other examples this structure is already being implemented, as mentioned. The final report from PolRess II, a project that supports the implementation and update of the German resource efficiency programme ProgRess with studies, specifically proposes developing the National Resource Efficiency Platform into an innovation platform with working groups and its own office and funding programme. This would be similar to that of the Industry Innovation Platforms 4.0 or Electromobility (note: which has existed since 2019 under the title National Platform Future of Mobility) (Jacob et al. 2019).

The National Platform Future of Mobility

The National Platform Future of Mobility is "the central place for discussing strategic decisions in the field of mobility" (Nationale Plattform Zukunft der Mobilität n.y.). With the involvement of relevant stakeholders, technical expertise and politics, the aim of the National Platform Future of Mobility is to provide clarification on complex topics, on the basis of which recommendations are made for politics, business and society. To this end, members of the National Platform Future of Mobility work together in six working groups, discussing and formulating recommendations for action. The work of these groups is partly subdivided into sub-working groups. These are intended to lay the foundation for the development of packages of measures for the design of sustainable mobility with reliable timelines. The National Platform Future of Mobility, in which actors work

together independently and voluntarily, was mandated in the coalition agreement for the 19th legislative period. In addition to the working groups, a steering committee provides technical and content guidance for the platform. It meets quarterly and, as required, brings new topics to the platform and provides suggestions for their implementation, controls the work of the working groups and monitors their implementation, advises on the results and publishes them. The platform is coordinated by an external, non-partisan and neutral office supported by the Federal Ministry of Transport and Digital Infrastructure (BMVI). An advisory commission serves as an interface to Parliament. The results are then presented to the steering committee by a leader of the working group. The office supports working group management and leading departments in the operational preparation, implementation and documentation of steering committee and working group meetings. In addition, there is an office for the chairman of the Future of Mobility platform, which brings together and processes the results of the working group and advises the management of the working group and the responsible departments of the federal departments on content. The results of the platform's work are published to make them accessible to a broad public. The National Platform Future of Mobility benefits from clear objectives and broad stakeholder participation, which is coordinated by an office and a steering committee.

Other stakeholder forums that accompany national strategy processes are already making use of the subdivision into topic-specific working groups. For example, the Energy Transition Platform Energy Efficiency works together in a plenum that meets regularly and whose meetings are supported by inputs from various working groups. The subdivision into topic-specific working groups enables the discussion of detailed questions of central topics. The members of the working groups are the members of the platform, but additional experts can be consulted if necessary.

The Energy Transition Platform Energy Efficiency

In order to structure its working methods, the Energy Transition Platform Energy Efficiency has set up five topic-specific working groups that meet in workshops, discuss detailed questions and develop recommendations for the plenum. During the development of the National Action Plan on Energy Efficiency, action fields were identified in a kick-off meeting that collected and discussed initial ideas for new measures. 100 proposals for measures were collected, evaluated and quantified in this process and, according to the Federal Ministry for Economic Affairs and Energy (BMWi), included in the development process of the National Action Plan on Energy Efficiency. The working group on financing issues in the Energy Transition Platform Energy Efficiency worked, for example, in the context of various recommendation papers in an iterative work process, with three telephone conferences being held to discuss the current status of work. There was an office for coordinating the creation and formulation of the working paper, which was coordinated with the "drafting group" and the department and then discussed and evaluated with the entire working group. Comments and additions could also be submitted in writing afterwards.

A survey presented at the ninth plenary session shows that the motivation of most participants in the Energy Transition Platform Energy Efficiency is to be informed and to express their opinion. While the plenum offers space for open dialogue and an overview of information, the quality of the dialogue in the working groups was rated positively.

The stakeholder forums are mandated by the responsible federal departments. Similar to the expert councils, the networks are coordinated by one or more leading departments and/or an external office. In addition, the network meetings can, for example, be chaired and prepared for and followed up by a steering committee or one, one or more chairpersons. In the context of

planning the meetings, several of the experts surveyed also agreed that it is important to communicate the dates of the meetings and the need for action for the network partners at an early stage in order to ensure sufficient time for preparations and internal coordination (especially by the stakeholders).

According to the PolRess II final report, stakeholder integration was successful in the strategy process of the national resource efficiency programme; the organisation of implementation workshops in the national resource efficiency platform for the further development of the resource efficiency programme being were rated as an innovative interaction format and a continuation is recommended for this reason (Jacob et al. 2019). As part of these implementation workshops, possible political instruments and measures for the further development of the strategy were discussed. When consensus or majority decisions are difficult to achieve due to differing interests, a stakeholder forum can reach agreement by outlining both consensus and dissent in an outcome paper. This approach was chosen, for example, by the Business and Human Rights working group of the CSR Forum. This can provide an alternative to lengthy voting processes where agreement is difficult to reach.

While the majority of the examples described above are used for mutual exchange and information, there are also associations of actors who help shape the political process. This is the case, for example, in the further development of the National Integration Action Plan, as described in detail in Section 3.2.1.1.1. There are similar insights from the working group process on the Federal Government's demographic strategy. Reports on the results of the working groups at the demography summit show that the chair is in the hands of a department that is supported by a co-chair of the design partners. The reports are structured differently, but in principle contain background information on clarifying the facts, action fields and goals as well as measures. The appendix also shows transparently who was involved in the working groups. The cooperation in the working groups is based on a preliminary work plan, which specifies a work concept, goals and work priorities, as well as composition and work structure.

In conclusion, it can be stated that the composition of the stakeholder forums varies, but they are generally broader and larger than expert councils. It should be emphasised in particular that the members are not independent experts, but rather organisations that represent relevant actors in a specific area and are invited to participate independently by the responsible departments. The tasks of the stakeholder forums vary: on the one hand, there are platforms that advise and accompany the implementation process of a strategy; on the other, in a few cases, stakeholders are actively involved in the orientation and design of the strategy process. In contrast to expert councils, an organisation-specific point of view is introduced instead of – or in addition to – scientific expertise. The work in specialist forums or working groups can be coordinated through the use of moderators, chairpersons or steering committees. With a larger number of participants, decisions do not have to be made according to a consensus or majority principle; for example, in the Business and Human Rights working group, consensus and dissent are described in reports.

Interviewed experts who have played a role in different strategy processes emphasised the challenge of defining a clear task for the network. In particular, the distinction between an advisory and a participatory function is important. A mixture of both dimensions is not seen as expedient. Irrespective of the Federal Government's decision-making authority in strategy processes, the advisory work of a network or committee can play a decisive role – from statements, to the naming of concrete action fields, to the collection, evaluation and quantification of proposals for measures.

One advantage of a pure expert council is that scientific expertise legitimises advice and a smaller number of participants facilitates coordination processes and decision-making. However, there is no broad participation of social actors who can bring in the experience of relevant stakeholders and ensure social legitimacy. This is a key benefit of a stakeholder forum; its larger number of participants can be reduced through the use of working groups in order to facilitate coordination processes and decision-making. Disadvantages of a stakeholder forum include the fact that some interests cannot be brought into the process due to a lack of capacity. A detailed participation process requires considerable time and human resources from the stakeholders involved, which smaller organisations often cannot provide. If a stakeholder forum were to be institutionalised as part of the DAS process, it would therefore have to be ensured that the effort associated with participation can be managed by all actors and that no relevant stakeholders are prevented from participating due to a lack of resources.

Table 22: Overview of the stakeholder forums and characteristics

	Government Demographic Strategy	NAP Integration	Business and Human Rights Working Group of the CSR Forum	Energy Transition Platform Energy Efficiency	National Resource Efficiency Platform
Composition	Working groups with an average of 20 actors from the Federal Government, states, municipalities, social partners, associations, business, academia and civil society	Federal working groups together with states, municipalities, non-state actors and migrant organisations	41 experts from business, trade unions, non-governmental organisations, science and representatives from relevant departments	40 – 70 stakeholders from business, civil society, science and affected departments and countries	Over 40 institutions: Business associations, environmental and consumer protection associations, trade unions, municipal umbrella organisations
Task	Discussion and further development of selected topics of the Federal Government's demographic strategy	Development of five core projects	Supporting implementation of the NAP for business and human rights and making recommendations for action	Develop joint solutions and support implementation of the NAP Energy Efficiency	Exchange of information on resource efficiency activities of the participants as well as support in the implementation and further development of the German resource efficiency programme ProgRess
Coordination and meetings	Ongoing process, which is coordinated by the Federal Ministry of the Interior, Building and Community (BMI); the working groups are chaired by other federal departments and design partners on a topic-specific basis	Ongoing working group process as part of the strategy process for the NAP Integration, coordinated by the Federal Commissioner for Migration, Refugees and Integration	The coordination of the CSR forum is supported by the Federal Ministry of Labour and Social Affairs (BMAS). The working group is headed by the deputy head of the German Institute for Human Rights (DIMR) and meets every two months, alternating with the IMA	The platform is supported by an office commissioned by the Federal Ministry for Economic Affairs and Energy (BMWi), which is operated by the German Energy Agency (dena) and the Institute for Energy Efficiency at the University of Stuttgart (EEP). The plenary sessions take place regularly, and the working groups meet up to four times a year, depending on the need	Coordination by the responsible specialist department in the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU); meetings take place every six months
Mandate	Federal Ministry of the Interior, Building and Community (BMI)	Federal Commissioner for Migration, Refugees and Integration	Federal Ministry of Labour and Social Affairs (BMAS)	Federal Ministry for Economic Affairs and Energy (BMWi)	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
Voting process	Work planning, which specifies a work concept, goals and priorities, as well as the composition and work structure of the working groups. The coordination process within the	Within each working group	Description of consensus and dissent	Within each working group	

	Government Demographic Strategy	NAP Integration	Business and Human Rights Working Group of the CSR Forum	Energy Transition Platform Energy Efficiency	National Resource Efficiency Platform
	working groups took place in writing and in individual meetings				
Outputs	Results reports	Five core projects	Recommendation papers	100 proposals for measures were collected, evaluated, quantified, recommendation papers from the working groups	Implementation workshops, recommendation papers

3.2.2.3 Starting points for the transfer to the German adaptation strategy

In summary, it can be stated for this analysis that both expert councils and stakeholder forums make a significant contribution to various strategy and action planning processes of the Federal Government. Both network types have clear advantages and disadvantages. It will be important for the further development of the Network of Authorities for Climate Change and Adaptation to develop a common goal and mutual understanding of network cooperation and to communicate this both internally and externally. Topic-specific cooperation in working groups has the potential to simplify coordination processes and pool specialist knowledge. The working groups can in turn develop input that is discussed in a plenary session. In addition, the need for action in the form of the time and effort required by the members should be planned and communicated at an early stage in order to enable the most efficient possible cooperation. This also includes allowing sufficient lead time for decisions within organisations. In addition, an expansion of the tasks of the network is conceivable. In addition to the selection and evaluation of political instruments, the network can contribute to the development of DAS target definitions. With regard to the composition of the network, the examples examined show which stakeholders should be involved in a possible expansion. This applies in particular to civil society actors, state and local government representatives, academic experts and the ultimate users of adaptation policy instruments.

Some limitations of the analysis should be mentioned with regard to the evaluation of the results. On the one hand, no exhaustive description of institutionalised and permanent networks that accompany strategy and action planning processes in the Federal Republic could be given, since networks can be of an informal nature, which implies limited publicly accessible information. Networks at European, state or municipal level were also not included in the analysis, since strategy and action planning processes at federal level were explicitly part of the analysis and these networks often did not accompany any concrete strategy process.

Nevertheless, the examples of other federal strategies show how the role of networks that accompany a strategy process can be improved and made more ambitious.

3.2.3 Analysis point 3: Non-constant formats for involving stakeholders and the public

3.2.3.1 Selective involvement of stakeholders

Since "wicked policy problems" such as climate adaptation affect a large number of social actors, the involvement of relevant stakeholders can contribute to an integrative strategy process and increase the legitimacy, visibility and acceptance of strategy processes. In addition to the Federal Government, relevant stakeholders include, for example, federal states, municipalities, associations, non-governmental organisations, associations, initiatives by citizens, business and academia. Since the evaluation of the DAS (Gaus et al. 2019) and the expert interviews and surveys show that the explicit involvement of the non-organised public (i.e. citizens) is viewed critically from some sides, this report considers that separately. The reasons for this are that it is considered difficult to organise local participation from the federal level and that citizens are not a central target group in the DAS.

The following section presents some examples of the selective involvement of stakeholders in other strategy processes of the Federal Government, in contrast to the institutionalised, permanent stakeholder forums discussed in Chapter 3.2.2. As part of the strategy process for the DAS, in addition to the participation of the Network of Authorities for Climate Change and Adaptation, relevant stakeholders are involved in a selective, non-permanent form. In addition

to a national dialogue event, there are also smaller stakeholder dialogues, project workshops, online consultations, cooperation exchanges and the "Blue Compass" competition. Cooperation exchanges for innovative, on-site adaptation solutions and participation processes for heavy rain preparedness in municipalities were established in individual locations; the database of the Climate Impacts and Adaptation Competence Centre (KomPass) collects adaptation measures and suggestions for actors in the field of climate adaptation.

The dialogue formats practised in the context of the DAS vary between small stakeholder dialogues with around 30 participants and events with over 100 participants. The national dialogue held in November 2019 with around 200 participants was used by the Federal Environment Agency to present the results of the DAS monitoring report, but also to discuss necessary policy instruments and measures in smaller workshops to make cities, agriculture and forestry as well as business locations and infrastructures more climate-resilient. The results of the dialogue are shared with the wider public online.

Events similar to the National Dialogue and other participation formats in the context of the DAS also support other strategy processes of the Federal Government. For example, a dialogue format was also used for the improvement of the BioEconomy 2030 research strategy. In order to identify focal points for the further development of the strategy, the Federal Ministry of Research and Education (BMBF) conducted a series of events in a dialogue format, which included congresses, workshops and technical discussions. Relevant stakeholders from academia, business, politics and civil society were able to attend . The conference "Together on the Bioeconomy" took place in summer 2018, with around 120 participants from academia, research and organized civil society. The goal: To formulate research needs and expectations for a new bioeconomy strategy. Participation formats of the conference included an online survey in the run-up to the event as well as workshops for which minutes were drawn up, sent for comments and presented to the responsible department. In addition, there were technical discussions on individual topics such as bioeconomy and digitisation, which shows that large conferences can be supplemented by other event formats in order to offer various opportunities for input and to work on relevant topics.

In addition to national dialogues or agenda conferences, there are also participation formats that extend over a longer period of time and at the end of which concrete proposals for measures on specific topics are published (so-called green paper processes). At the beginning of a green paper process, there are theses, analyses and key questions to which relevant stakeholders can react within the framework of various event and participation formats. Concrete recommendations for action are then developed and published from the reactions and comments received. One advantage of the green paper process is that it creates a common basis for knowledge and discussion. For example, green paper processes have already been carried out by the BMWi on the topics of digital platforms and energy efficiency.

Green paper on energy efficiency by the Federal Ministry for Economic Affairs and Energy

As part of a green paper consultation, the BMWi has drawn up guidelines for the medium to long-term improvement of energy efficiency policy with the participation of relevant stakeholders. In addition to the National Action Plan on Energy Efficiency adopted in 2014 and parallel to the Electricity 2030 discussion process, a green paper process on the topic of energy efficiency took place. The aim: To debate the medium and long-term optimisation of energy efficiency policy with the participation of associations, federal states, companies, scientific institutions and private individuals and develop concrete options for action. From mid-August to the end of October 2016,

theses, analyses and key questions were discussed in statements, dialogue events and an online consultation. A total of 145 comments from almost 200 respondents were obtained, showing that the green paper process was well received. The public dialogue events included a joint plenary round of the energy transition platforms for energy efficiency and buildings, a dialogue event in Brussels to involve European stakeholders, and four regional dialogue events in Dortmund, Hamburg, Stuttgart and Dresden. The Green Paper on Energy Efficiency was commented on online 350 times, and all theses were voted on a total of around 24,600 times. An evaluation report contains opinions and positions resulting from the consultation process as well as an overview of the approaches for the strategic optimisation of German energy efficiency policy endorsed by the participating associations, companies, public authorities, research institutions and private individuals (Bundesministerium für Wirtschaft und Energie (BMWi) 2017). Individual agenda conferences or green paper processes can be part of a broad social dialogue.

As mentioned in Section 3.2.1.1.1, a specialist dialogue like this took place in the run-up to the mobility and fuel strategy, after an initial preliminary investigation into the framework conditions. The process included 337 people from around 180 institutions, including representatives from academia and research, industry and professional organisations. Participation formats included workshop talks, fact-clarification workshops, specialist talks to deepen individual topics and workshops in which concrete recommendations for action were developed. In addition, a specialist forum for exchange between the federal and state governments took place, as well as a two-day practical dialogue for users of mobility in everyday life. The specialist dialogue took place over several months and, in addition to the participants mentioned above, political actors also took part and exchanged views with relevant stakeholders about medium- and long-term goals. The specialist dialogue created a kind of network of actors, which was also integrated into the later strategy process. The proclamation of the participation procedure for the mobility and fuel strategy as a lighthouse project 2012 of the national sustainability strategy gave this process a high political priority. The participation process was recognised by the State Secretary Committee for Sustainable Development and identified as a model for dialogue processes (Bundesministerium für Verkehr, Bau und Stadtentwicklung [BMVBS] 2013).

Great importance was also attached to broad participation in the improvement of the National Action Plan for the Implementation of the UN Disability Rights Convention. The draft of the National Action Plan was discussed with relevant stakeholders during the inclusion days. According to the Federal Ministry of Labour and Social Affairs (BMAS), the results of stakeholder participation were included in the updated National Action Plan. The monitoring report, however, states that it is not transparent at all points to what extent the results were taken into account (Bundesministerium für Arbeit und Soziales [BMAS] 2014). In this regard, the Federal Ministry of Labour and Social Affairs (BMAS) refers to the departmental principle, which, within the framework of participation in the development and implementation of individual measures, leaves the decision on the type and scope of participation to the body responsible for the respective measure. With regard to stakeholder participation, several of the experts interviewed pointed out that if stakeholder participation takes place, it is particularly important to communicate how recommendations are incorporated into the further development of the strategy and why certain recommendations or comments may not be included. The evaluation of the dialogue process on the Climate Protection Plan 2050 also points to the relevance of feedback loops and feedback following stakeholder participation.

The evaluation of the dialogue process on the Climate Protection Plan 2050

In the course of drawing up the Climate Protection Plan 2050, the Federal Government started a broad dialogue process in order to achieve wider acceptance of climate protection measures by social groups. The federal states, business, civil society and citizens were involved in the development of measures to achieve the climate protection goals in actor-group-specific forums and action-field-specific working groups as well as a central, cross-actor committee that accompanied the entire process and promoted exchange between various stakeholders. The developed proposal was then submitted to the Federal Minister for the Environment. In principle, a dialogue process of this scope can be seen as a new and suitable approach to political discussion and decision-making (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) 2017). However, the evaluation of the dialogue process also shows some potential for optimisation. The legitimacy and selection of actors involved could benefit from a thematic comparison of the portfolios of the organisations as well as a more systematic and transparent selection. The weighting and role of smaller associations in the participation process may be limited by their scarce capacities. This can be counteracted by a low-threshold options such as online consultations. A lack of clarification of expectations for political decision-making and feedback can be addressed by a functional description of the process and its formats, clarity and transparency in process control and implementation, stakeholder participation in the selection and prioritisation of individual topics as well as a clear explanation of the goals and options to take part. In addition, a sufficient time frame is of great importance to ensure that the dialogue process runs as smoothly as possible (BMUB 2017).

3.2.3.2 Participation and information of the public

3.2.3.2.1 Citizen dialogues and online consultations

In addition to stakeholder participation, through which the organized public in particular can be involved in a strategy process, there are also ways of involving the unorganised public, as well. In line with the understanding of citizen participation used in the report on "Citizen Participation at the Federal Level", the underlying understanding here is that citizen participation has the potential to bring citizens' ideas into decision-making and planning processes without calling into question the sovereignty of governments (Fielitz and Domasch 2017). Until now, participation by the unorganised public has primarily taken place at the municipal level. Participation of citizens at the federal level is faced with larger coordination and informational challenges that have to be included in the design and implementation of a corresponding procedure. Nevertheless, there are strategy processes that are accompanied at federal level by the participation of citizens, including, for example, the national resource efficiency programme ProgRess, "Living Well in Germany" and the mobility and fuel strategy.

Participation of citizens at federal level: The national resource efficiency programme ProgRess

The update process for the Federal Government's national resource efficiency programme ProgRess included the participation of citizens at federal level in the form of the citizen dialogue: "Discussion Material - Resource-friendly Living: Citizens in Dialogue" (Fielitz and Domasch 2017). In order to incorporate the opinions and ideas of the citizens into the update process of the National Resource Efficiency Program, five citizens' workshops were organised with a total of 200 randomly selected participants. Participants discussed five different subject areas. In addition to the citizen workshops, there was also online participation on the project website. Following the citizen workshops and the online dialogue, two participants were sent to Berlin as ambassadors in order

to formulate citizen advice based on an evaluation report, which ultimately contained twelve specific recommendations for action and was handed over to the Federal Minister for the Environment.

The advice was checked by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and integrated into the updated strategy as far as "possible and sensible" and shown in the appendix to the strategy. Finally, those accompanying the process interviewed the Federal Environment Minister to what extent the citizen advice could be incorporated into the strategy in order to ensure the transparency of the process and to give citizens feedback. The process was followed by an evaluation of citizen participation at federal level, which made five recommendations for future citizen participation in updates to the strategy: (1) use different participation instruments; (2) select citizens at random; (3) interest in content is a greater incentive to participate than reimbursement of expenses; (4) political commitment is decisive for the relevance of the results; and (5) strategies that require updating can benefit from early participation (Fielitz and Domasch 2017).

Challenges within such a process are, among other things, that it is costly and time-consuming and that people are often primarily reached who are already dealing with the topic. One expert stressed the critical point of creating a knowledge base on which to discuss a complex issue in a meaningful and effective manner, which is difficult to achieve when involving citizens. The accumulated experience and knowledge of this participation of citizens at the federal level can serve as a basis from which future procedures can benefit. A set of citizen recommendations was also developed for the update to the third resource efficiency programme.

A broad survey process also took place for the "Living well in Germany" strategy, culminating in an evaluation from which 12 dimensions of quality of life for Germany were derived. In 2015, 203 citizen dialogues were held in all federal states, major cities, but also rural communities. In addition to the citizen dialogues, an online dialogue also took place, as well as a postcard campaign. The organisers were able to reach 15,750 people and incorporate their ideas of a "good life" into a report. That report was then used to create an indicator system that describes what is important to German citizens for a "good life" and how this can be measured (The Federal Government 2016).

In addition to workshops, citizens can also be involved in the strategy process through online participation formats. Online participation formats are also used in the strategy processes for the German Sustainability Strategy, the National Action Plan for the implementation of the UN Disability Rights Convention and the Demography Strategy. Schulz and Newig, for example, analyse the "Mitreden-U" format, which took place in 2010 as part of the strategy process for the German Sustainability Strategy. They conclude that online consultations have the potential to break down management structures and enable meaningful interactions, but require careful planning and require a cultural change on the part of public administration (Schulz and Newig 2015).

The demographic strategy also strives for a comprehensive dialogue process, which includes extensive online options. The federal and state demography portal brings together existing activities and initiatives and serves as a means of communicating with the public. Under the "Mitreden" ("have your say") tab, anyone interested has the opportunity to get involved in the dialogue on the Federal Government's demographic strategy. The demographic strategy aims to reach a sustainable consensus, which also includes a dialogue with the citizens.

3.2.3.2.2 Visibility, information and transparency

In addition to the participation of citizens in a strategy process, the question of how to inform the public about strategic goals and developments, how to make the strategy process transparent and comprehensible, and how to increase the visibility of the Federal Government's activities is also relevant. In addition to the tried-and-tested formats of conventional stakeholder participation "offline", online formats are gaining in importance these days.

One way to make the strategy process transparent and visible, as well as inform the public, is to have a dedicated website that provides information about the work in the Federal Government, but also about other actors involved in the strategy process, such as expert councils and stakeholder forums. The availability of documents, minutes of meetings, position papers and similar material is of central importance to the transparency and traceability of a strategy process. Examples include the websites of the Bioeconomy Council, the High-Tech Forum or the Council for Sustainable Development, the National Energy Transition Platform Energy Efficiency or the National Platform Future of Mobility. Social media can also be used by networks to communicate with the public. For example, the High-Tech Forum has its own Twitter account.

In some cases, entire strategy processes are represented by a detailed online presence. Good examples of this include the website of the CSR Forum, which also provides content on the strategy process of the National Action Plan for Business and Human Rights, or the Federal Government's demography portal. In the Federal Government's demography portal, action fields are brought together and supplemented with factual and practical knowledge. The Federal Government's High-Tech Strategy 2025 also has a detailed online presence that provides information on the strategy, its missions, action fields, implementation, measures and services. A list of the 298 measures can be filtered by mission, department and topic.

In order to strategically address the issue of transparency, information and visibility, a communication strategy can also be developed to guide the process, as happened with the National Integration Action Plan.

However, offline formats to increase transparency, information and visibility should not be ignored. The national dialogue "GesprächStoff," in which the Federal Environment Minister interviewed organisers to explain how the results were incorporated into the National Resource Efficiency Program, received positive feedback. The Bioeconomy Council has also organised offline events to increase visibility and to inform citizens – for example an exhibition on "Bioeconomy in Everyday Life". However, one expert in another strategy process noted that online participation often reaches people who are already involved in the subject matter. Media-effective competition formats such as the presentation of the Federal Government's CSR Prize or lighthouse projects also have the potential to increase the visibility of a topic. This idea was already taken up by the Federal Environment Agency as part of the "Blue Compass" ("Blauer Kompass") competition, which awards projects dealing with the consequences of climate change.

Even though individual pages on KomPass and adaptation to climate change can be accessed on the website of the Federal Environment Agency and a German climate protection portal has been set up, there is no comprehensive, transparent website or a central contact point for information and documents relating to the DAS strategy process. Especially today, when there is increased public attention due to the first noticeable effects of climate change in Germany (e.g. heat waves or severe storms), as well as ongoing protests by groups such as "Fridays for Future", communication with the public is essential for visibility, understanding and acceptance of the population. In order to increase the visibility of the strategy process for the further development of the DAS for a broad public and to ask the opinion of the German population about the need for

adjustment, a uniform and separate website for the strategy process could be promoted. The example of the Federal Government's demography portal is a good example of what such a portal could look like. It contains facts on the topic, strategy documents from the Federal Government and other levels or outputs from network and committee work and offers the opportunity to take part in surveys and online dialogues.

3.2.3.3 Starting points for the transfer to the German adaptation strategy

In summary, it can be stated that there are various tried-and-tested formats for selective, non-permanent stakeholder and citizen participation. While agenda conferences, specialist dialogues or green paper processes are the main options for the participation of the organized public, citizen workshops and online options play a particularly important role – and can also be combined at federal level. One clear advantage of broad public participation is that it enables the exchange of expertise, experiences, ideas and different perspectives from society. These are required to successfully address a wicked policy problem such as climate adaptation. In addition, the participation of relevant stakeholders and citizens in a strategy process that affects a problem affecting society as a whole, such as climate adaptation, provides a sound foundation and legitimacy for the strategy process. However, the potential "double" participation of citizens in stakeholder groups and additionally as an individual group should be considered. In addition, especially with regard to participation by citizens, challenges such as costs, time and a common knowledge base for a meaningful discussion must be taken into account.

In the context of the DAS, it must be carefully considered whether an institutionalised and permanent approach to stakeholder involvement underlines the "learning" character of the strategy, whether selective, non-permanent approaches correspond more to the strategy process, or whether a combination of the discussed approaches is most effective. In order to increase the visibility of the strategy process for the further development of the DAS for a broad public and to ask the opinion of the German population about the need for adjustment, a uniform and separate website for the strategy process could be promoted. It may be useful to conduct comprehensive surveys both online and offline (see "Living Well in Germany"). Of course, possible synergy effects with existing online offers from the DAS (see KomPass, the German Climate Protection Portal [KLiVO Portal], etc.) should be considered.

3.3 Conclusion

3.3.1 Success factors in the implementation of political strategies

With the insights of the previous chapters, it is possible to identify a number of success factors for various processes within political strategies.

3.3.1.1 Cooperation between departments

For cooperation and coordination between the ministries involved, it is of central importance to overcome the widespread departmental thinking and interministerial competition and to achieve a higher-level perspective. An effective climate adaptation policy can only be achieved through the coordinated policies of the Federal Government in various areas. A national representative at the federal level or national focal point could take such an overarching position

and ensure coherence through a high-level perspective on the process, identify synergies at an early stage and avoid duplication of efforts.

Another success factor for good cooperation between departments is personal and political continuity at the specialist level. Coordination both at this technical level and at a higher level, for example through meetings of state secretaries, has proven to be particularly effective. A combination of these two bodies enables direct professional exchange and, at a higher hierarchical level, coordination between departments without lengthy internal consultation processes.

3.3.1.2 Action planning processes

One decisive success factor for a successful action planning process is a clearly defined goal from the beginning. On the one hand, this should make clear which goal is to be achieved with the strategy as a whole and, on the other hand, show what the goal of the action planning and coordination process is. In particular, the assignment of measures to specific goals is another factor to clarify in what form the respective measure contributes to the achievement of the goal. In this way, transparent and clearly formulated goals also serve the implementation of action plans.

The clear definition of the work assignments is crucial for stakeholder committees or working groups involved in the process. This includes, for example, the definition of minimum and maximum requirements for the output.

3.3.1.3 Networking

Networks and committees, which play various roles in a strategy process, should take into account a number of factors in order to ensure successful collaboration. This includes a limited number of members to maintain the ability to work and make a quorum. In order to integrate a broad range of technical expertise and different stakeholder groups, there should be a division into topic-specific working groups. The clear assignment and definition of objectives contribute to result-oriented cooperation in the network. Following from this, it is important to create a common understanding of the group for all members in order to prevent later misunderstandings and dissatisfaction. For clear conditions regarding the working method and decision-making, participants can make use of rules of procedure. It can also be stated here that, under certain circumstances, there is no need for consensus for a decision-making process; in cases where no agreement can be reached, the parties involve can document the dissent and address it in the outcome paper. This approach often prevents lengthy processes to reach a minimum consensus.

All of the experts surveyed emphasised the creation of a space for confidential exchange as an essential success factor. This also includes transparent communication channels and coordination mechanisms. Also important for a successful workflow is the early communication of the procedure and individual methodological steps. This type of predictability and sufficient lead time before decisions enable internal opinion formation for represented organisations.

Clearly defined roles for chairpersons and coordinators of the network work also contribute to its success. The entire work process should be kept lean and comprehensible. Too-frequent and too-detailed information that is passed on to participants tends to be counter-productive; too much information means that the participants are no longer involved in the process.

Finally, the Federal Government's recognition of the commitment of the actors and stakeholders involved is a central factor that increases the motivation to participate and maintains it over longer work processes. This includes feedback as to whether and to what extent the results and recommendations for action were included in the further development of a strategy or an action plan.

3.3.2 Suggestions for optimizing the DAS processes

In addition to these general success factors that apply to the broad range of strategy processes, various tips specific to the further development and optimisation of the DAS process can be derived from the comparative policy field analysis. For reasons of clarity, these are divided into procedural, methodological and institutional aspects.

3.3.2.1 Process optimisation

The process of action planning includes the selection and, if necessary, evaluation and prioritisation of measures. An integrative process for the joint development of measures, bundles of measures or core projects by departments and stakeholders promises opportunities for further process development. In order to ensure a functioning workflow with a comprehensive procedure for stakeholder involvement, it helps to divide the process into thematic working groups. In this way, the relevant experts and stakeholders for specific content can be involved without excessive participants making the process confusing and difficult to coordinate. The working groups should each report back to the general plenum, where an interdisciplinary exchange takes place.

The decision on which stakeholders to involve in the process should be based on an initial structured survey of all relevant stakeholders to get feedback on who is interested in such involvement. The distributors of the relevant departments of the BMU and UBA as well as an online announcement could be used for this survey.

Beyond the Network of Authorities for Climate Change and Adaptation, the involvement of stakeholders has been, up to this point, largely selective and non-institutionalised. This can change during the optimisation of the process; it is possible to establish a structured participation procedure, as is the case in numerous other strategies. Such a comprehensive stakeholder dialogue includes long-term committees with regular meetings, defined work output and tasks, coordination by a separate office and regular exchange with the departments. It would also include various working groups and suitable formats that can be flexibly adapted depending on the work assignment and process phase. This can create a critical foundation for the further development process of the DAS and the measure selection process within the framework of the APA.

In addition to clear target agreements, the APA should also specify clear responsibilities for the implementation of measures and include time and work plans. For the entire course of the process, it should be ensured that it is clearly communicated how the respective input will be used by the departments or the IMAA. If possible, feedback on how the respective comments and suggestions were dealt with and why comments were not further considered should also be communicated. The action required and expectations of those involved in the process should also be defined before the start of a participation process and communicated to all participants.

Public attention to the political field of adaptation to climate change has increased significantly in recent years. In order to take this increased interest into account and address the associated need for information, a central website can be set up for the DAS and the associated processes

and portals. Such a website can provide an overview of the activities of the Federal Government, provide all relevant documents, including recommendations from any stakeholder committees, for inspection and comment, and contain links to portals such as the KLiVO portal. This would significantly increase the visibility of the DAS and the external impact of the Federal Government's climate change adaptation activities. A central point of contact for all interested parties was rated positively in all strategy processes. Public consultations, which can take place both online and offline, can make a further contribution to the transparent, broad communication of the goals and activities of adaptation policy. These can increase public acceptance and understanding of adaptation policies and reduce subsequent resistance to policy implementation. The possibility of such a structured public consultation should be explored for the continued action planning process.

3.3.2.2 Methodological optimisation

In terms of methodology, it is possible to derive guidelines to optimise the evaluation and prioritisation procedure for adaptation measures. The analysis results provide information on suitable assessment criteria that can be used for an evaluation procedure. As of yet, the administrative and political feasibility of measures, including the implementation costs, and macroeconomic effects such as distribution and regional policy effects have not been considered. A new method can take at least some of these factors into account and include them in the assessment. One helpful addition to the evaluation criteria is the provision of key questions that help the participants to classify the criteria.

There are various options for prioritising proposals for measures that are made as part of a recommendation by the network of authorities or any other bodies, if such further development is desired. It is conceivable to determine a number of measures to be implemented as a priority based on the evaluations submitted. A previously defined number of measures that have received the highest rating are passed on accordingly as a priority. Alternatively, points can be awarded; participants can identify a certain number of measures as having priority by allocating those points. The measures that received a point from the most stakeholders are then listed as priorities. Both of these proposals can be implemented without significant additional effort as part of the selection and evaluation process of the network of authorities. In this case, it would be important for the resulting priority measures to be listed as such in the APA and highlighted from the multitude of listed measures.

An alternative further development of the APA could also be achieved through the development of clearly defined core projects. A limited number of such detailed core projects enables activities to be focused and at the same time increases the visibility and accessibility of the measures.

3.3.2.3 Institutional optimisation

The permanent and institutionalised expansion of the previous participation process is suitable for involving stakeholders in the DAS and APA process. One option for such an expansion is to broaden the network of authorities by adding representatives from local authorities, states, civil society and business. However, this can easily overload the structure and functioning of the network. A stakeholder committee that complements the network is therefore a better option. While the network of authorities is set up similarly to an expert council (albe it with a larger number of members), a stakeholder forum can ensure the ongoing involvement of a wider range of stakeholders.

A clear objective and functional description should be drawn up for the network of authorities itself and, if necessary, set down in the form of rules of procedure. As in mentioned in Section 3.2.2.3, it will be important for the further development of the network to create a common goal and mutual understanding of network cooperation and to communicate this both internally and externally.

In terms of the composition of a stakeholder forum, the selection of participants should be systematic and transparent. Based on a general query as to which actors would like to get involved in such a process, the selection can ensure that all relevant stakeholder groups are represented and that positions/stakeholder groups with few resources are also integrated. In order to achieve a manageable size, the stakeholders involved should be divided into content-related working groups. In these working groups, an overlap with the network of authorities is conceivable and sensible. Topic-specific cooperation in working groups has the potential to simplify coordination processes and pool specialist knowledge. The outputs generated in the working groups should in turn be discussed in the plenum in order to create a coherent overall process.

One clear advantage of broad stakeholder and citizen participation is that expertise, experiences, ideas and different perspectives from society can be exchanged. Such an exchange is required to successfully address a wicked policy problem such as climate adaptation. In addition, the participation of relevant stakeholders and citizens in a strategy process that affects a problem affecting society as a whole, such as climate adaptation, provides a sound foundation and legitimacy for the strategy process. It should be added, however, that such an approach requires a considerable amount of additional resources.

In addition, selective participation through events should also be maintained. The analysis encountered repeated emphasis on the importance of a platform for exchange and networking between actors. It is particularly beneficial to see which activities are carried out by other actors and who the relevant contact persons are. Permanent involvement like this, in combination with supplementary dialogue processes, represents a sensible improvement to the DAS process and can increase its legitimacy, acceptance and visibility.

Based on the analysis results, a more fundamental reorientation of the DAS and the APA itself is also recommended in order to achieve a higher level of ambition in German climate adaptation policy. The noticeable effects of climate change mean an increased need for the implementation of effective adaptation measures. The transition of the DAS into such an implementation-oriented phase requires stronger political backing and corresponding institutional integration. A strategic realignment of the DAS along the guiding principles and/or core goals, developed in cooperation with the IMAA and other stakeholders, is therefore recommended. This would allow a bundling of activities and actors as well as the linking of different levels, specifically the levels of the federal states, municipalities and civil society. With the help of a clear definition of goals, the joint pursuit of these objectives by the stakeholders involved would be promoted, as would the development of increased implementation and cooperation dynamics. The focus of activities along missions or core projects would also increase the visibility and external impact of German climate adaptation policy. This could address one of the most common challenges that became clear in the examined strategy processes: Ensuring effective coordination of the many individual measures with one another and the targeted alignment of numerous activities. The process could also address conflicting goals and make use of synergies. Overarching guiding principles like these should be developed together based on input from the network of authorities, technical experts and other stakeholders.

4 Recommendations for the further development of the DAS

This chapter works out a concept for the improvement of the DAS based on the consolidated findings of the previous analyses. This includes reasons and recommendations for optimising policy design in German climate adaptation policy, improved stakeholder involvement and the increased integration of different policy levels.

The options for the optimisation of the DAS presented in this chapter relate to various aspects and levels of German climate adaptation policy. One important focus of this project was to provide tips for optimising the DAS policy design. These include various elements, including selection and evaluation processes of policy instruments for the Adaptation Action Plan (APA). This chapter first discusses how these processes can be improved overall for the APA and then specifically explains how the process of evaluating policy instruments through the agency network can be improved. For this purpose, concrete recommendations are made as to how a new procedure could be optimised with the cooperation of the network of authorities.

One further aspect of optimising the policy design addresses the involvement of actors in this concept, including the continuation of participatory processes. In addition, the chapter explains the impetus for the design of a policy mix in German adaptation policy based on the scientific literature. This includes, in particular, the procedure for individual instruments and combinations of instruments.

Recommendations for overarching aspects of adaptation policy, which are set out in this concept, include, among other things, the improved vertical integration of adaptation policy. Furthermore, this report refers to the process for formulating a vision for a climate-resilient Germany 2060 set down in the second progress report on DAS and explains what potential effects the results of this process can have on policy design and especially the development of adaptation measures.

4.1 Evaluation and selection processes for adaptation measures

One central aspect of policy design is the creation of an optimised catalogue of measures in the form of the Adaptation Action Plan (APA). Part of the development of this action plan is a selection and evaluation process for the policy instruments and instrument combinations. The following sections provide guidance on how to streamline this process to arrive at an effective and efficient policy mix.

A number of ideas for an optimised approach to such processes can be derived from the analyses carried out in the research project and the reflection on the selection and evaluation procedure for the policy instruments of APA III. At various points in the comparative policy analysis, the benefits of an integrative approach to action plan design processes characterised by extensive involvement of a wide range of stakeholders were highlighted. Such a broad-based process would go beyond the involvement of the network of authorities and involve other stakeholders. This process would involve experts from relevant specialist areas, those involved in the implementation of measures and particularly affected population groups. This would take more work and resources to coordinate the process – however, extensive preparatory work for the

selection of measures can facilitate their later implementation and increase the quality of the APA.

For the selection of new policy instruments and measures within the framework of an optimised policy mix in climate adaptation, a detailed consideration of the existing measures is also required. Otherwise, so-called "layering" can occur, in which new instruments and combinations of instruments are added to existing policy instruments without an overarching view of possible interactions and the long-term consistency between these instruments (Ekvall et al. 2016). The basis for a selection process that prevents such a misalignment is provided by the results of the Climate Impact and Risk Assessment 2021 for Germany (KWRA). The urgent and very urgent needs for action in that report are based on the analysis of the importance of climate impacts, the effectiveness of existing and more extensive adaptation measures as well as the probable duration of adaptation. In this way, the report presents existing adaptation planning, to which the selection of new instruments and policy mixes should be geared. This offers an approach to avoiding layering and using new instruments where there is a clear need for action.

A clear structural improvement of the APA can take place through the development and selection of clearly defined and prioritised core projects. With such an approach, a limited number of core projects that have been worked out in detail, each comprising various activities, would enable measures and activities to be focused. At the same time, the visibility and accessibility of the adaptation policy can be increased in this way compared to an extensive list of individual measures as in APA III. The establishment of the Centre for Climate Adaptation can be seen as an example of such core projects due to the scope of activities and range of stakeholders addressed. Further core projects should be geared in particular to the urgent and very urgent needs for action identified in the KWRA.

A selection of political instruments and policy mixes should also be based on a transparent evaluation process in the action planning for the implementation of the DAS. In general, such evaluation procedures serve the purpose of bringing a higher level of objectivity into the political process by basing decisions on concrete criteria and indicators. A multi-criteria analysis (MCA) is the most suitable method for such a procedure in the field of climate adaptation. In such an analysis, both qualitative and quantitative information can be integrated. Since many effects and goals of climate adaptation measures are difficult to quantify (e.g. reduced health damage from heat), methods such as a cost-benefit or cost-efficiency analysis are usually much less suitable in this context.

Of central importance for the implementation of an MCA is the development of a list of criteria and indicators, which can be used to estimate the likely effects of an instrument or a measure, record uncertainties and present possible conflicting goals. An MCA in the area of climate adaptation can also integrate aspects such as the urgency of implementing a measure, positive co-benefits and advantages even into the framework, in the absence of (strong) climate change impacts. The development of this catalogue and the evaluation methodology should be carried out in a participatory process involving the relevant actors – in particular the later decision-makers. Such an approach can ensure the compatibility and acceptance of the evaluation results in the political process. For German adaptation planning, this means that an assessment methodology, the criteria and assessment basis should be coordinated with the Interministerial Working Group on Adaptation (IMAA) and the network of authorities.

In addition, in an MCA-based assessment process, different climate change scenarios can be considered and the properties of policy instruments can be assessed in light of these scenarios. For a further development of the assessment procedure in the context of the APA, it is particularly appropriate to use the characteristics of climate change developed in the KWRA and

used for the assessment of climate risks and adaptive capacity, referred to as optimistic and pessimistic cases. These two scenarios represent important basic assumptions on the basis of which instruments are evaluated. In this way, proposed policy instruments and measures can be analysed in terms of the extent to which they are effective, efficient and flexible in an optimistic and in a pessimistic climate change scenario. Such an application of different climate scenarios was also put forward as a recommendation in various discussions with international experts in climate adaptation planning in order to show a range of possible measures and their potential effectiveness.

In general, when implementing an assessment procedure for the APA, it is advisable to involve experts and other stakeholders more widely. This was noted as helpful in numerous discussions with experts, and the network of authorities also suggested involving additional experts in the process. This can be done, for example, with the help of a structured expert survey before the start of an evaluation process and the involvement of relevant experts and actors based on this. The validity and acceptance of the results can be strengthened by taking into account different perspectives associated with such an approach. In addition, through the additional involvement of the state level, possible incoherences or conflicting goals with activities located there can be identified at an early stage.

With regard to the handling of deviating assessments by those involved in an MCA, experts recommend, instead of using the average value of individual assessments, to consult with the evaluators to check what the different assessments result from (e.g. different levels of knowledge or different understandings of terms). The objective should be the development of joint evaluations through discussions among the involved experts. When dealing with uncertainties in the assessment or with regard to the foundational data, these uncertainties should be presented transparently at every step.

A frequently voiced criticism of these evaluation methods based on the opinions of experts relates to their subjective character. An optimised procedure should therefore relate as much as possible to scientific analyses, modelling and studies. However, this would entail a considerable expenditure of resources, as such scientific knowledge bases for evaluating the effectiveness and other properties of numerous adaptation measures are not yet available. Carrying out extensive research or new studies for all proposed instruments of the APA cannot be integrated into the corresponding processes. On the other hand, one potential, pragmatic approach with limited resources is the evaluation of the measures by experts and stakeholders based on defined criteria. Subsequently, those instruments for which there is (strong) dissent in the evaluation are analysed in more detail using specialist studies, empirical research, modelling or similar methods. Potential sources here can be insights gained through the implementation of similar instruments abroad or at regional level.

The subjectivity of assessments by experts can be further reduced by integrating the assessment by actors from different backgrounds, perspectives and interests into the process. This includes the users of instruments as well as particularly affected and vulnerable groups. This aspect also speaks for extended participation in the evaluation processes of adaptation measures.

Evaluation criteria

As already mentioned, the evaluation criteria are a central factor in an ex-ante selection and evaluation process for political instruments, measures or policy mixes. The determination of the effectiveness of the measures was in the foreground of most of the ex-ante evaluation methods examined in this project. In addition to the effectiveness criterion, the analyses considered

included the economic effects, acceptance and legal feasibility of measures. For the evaluation of policy instruments for climate adaptation, the criteria of macroeconomic effects, possible positive contributions to socio-ecological goals and political and legal feasibility should be considered as possible additions to the catalogue of criteria.

There is further optimisation potential with regard to the criteria of coherence and possible synergy included in the previous evaluation process of instrument proposals for APA III. The evaluation of individual measures based on these criteria proved possible only to a limited extent; this process has restricted application to individual policy instruments and instead a consideration of the instruments as a whole is necessary. It is possible to improve the evaluation process, for example, by using the strategy impact assessment ("Strategiefolgenabschätzung", SFA) developed by the UBA. With the help of this tool and by applying a comprehensive analysis of possible interactions between the various policy instruments across all action fields, it is possible to significantly improve the quality of the policy mix. These analyses should not only relate to impacts on other adaptation activities, but also consider implications for environmental and social policy goals.

Also relevant for the evaluation of adaptation measures is the timeframe for the development of effects, i.e. how much lead time a measure needs before it becomes effective. To this end, it is possible to work out a timeframe-based prioritisation for the APA. Here, too, the work of the KWRA can be built on, where an assessment of the adaptation period with regard to individual climate effects was an essential part of the classification of urgent and very urgent action requirements. Based on these findings, the temporal prioritisation levels of the individual measures can be defined in the framework of APA IV.

4.1.1 Recommendations for the possible design of a new procedure with the network of authorities

A structured evaluation process for political instruments and policy mixes for climate adaptation was implemented recently in Germany. This will continue in the future with the participation of the Network of Authorities for Climate Change and Adaptation (The Federal Government 2020). The central actors in this context are the network partners, i.e. representatives of the various authorities involved in the network. Based on the reflections of the project consortium and the feedback collected from those involved, it is possible to work out guidelines for the methodological and structural optimisation of the evaluation process and improve the policy design.

For a successful process, it is essential that its methodology and objectives are clearly communicated from the start. In addition, there needs to be a common, uniform understanding of the concepts by all those involved. A failure to do so will result in discrepancies in the process, which can limit the validity of the results. The foundation of a new procedure must therefore be the creation of a uniform understanding of the objective, the methodology and the evaluation criteria among all those involved in order to ultimately arrive at a joint and – as much as possible – objective evaluation. Comparable evaluation results across the various subject areas can only be achieved with a congruent foundational understanding. Before the start of a new procedure, the tasks of the parties involved should therefore be explained and discussed in detail. In addition, evaluation steps should be piloted before all network partners apply them. The potential end result of the procedure should also be presented and explained to those involved in advance in order to ensure that all parties share a common understanding of the

task. In this way, it can be made clear how the evaluations will be used and how this contributes to the ultimate objective of the process.

Another aspect that needs to be considered in order to ensure the highest possible level of objectivity is the varying degree of involvement of the different authorities. For example, in the process of developing instrument recommendations for APA III, this led to a widely varying number of policy instruments in the relevant subject areas. As part of a new procedure, a so-called "gap analysis" should therefore be carried out after the first round of voting; this process can examine to what extent there are major discrepancies in the number of proposed instruments in the relevant action fields. In this way, any weaknesses in the instrument pre-selection can be identified and addressed with additional suggestions.

A close connection with the results of the KWRA is recommended for the entire procedure of selecting and evaluating adaptation instruments. The need for action derived from this analysis and the assessment of the adaptive capacity provide a suitable basis for the next action planning process. In addition to this need for action, options for more far-reaching adaptation, i.e. additional adaptation measures, have already been compiled in the analyses of the adaptive capacity.

In addition, ensuring transparency for all those involved is of great importance. On the one hand, this concerns an early involvement of the network partners in the detailed development of the methodology. Here it is important to obtain feedback from the network partners during the development of the tools and the procedural steps and to integrate this into the further development of the methodology. Procedural transparency should also include information on which authorities are involved in the various thematic working groups and are asked to make an assessment. Therefore, topic-specific overviews of the institutions and, if necessary, external experts involved should be created and shared with the network partners. This would enable those involved to communicate and, if necessary, consult with each other. It is also recommended to extend transparency to the handling of feedback from network partners. It should be disclosed how individual feedback was dealt with and why certain comments were not included.

The clear objective of the procedure should be to develop a result that is coordinated and supported by all those involved. In order to achieve this, detailed coordination and discussion processes should be scheduled. In the case of a topic such as the evaluation of political instruments and measures, which is highly complex, processing by individuals is often prone to strong subjectivity in individual evaluations. This requirement means that detailed discussion rounds for the various subject areas are of great relevance. As part of these events, content-related debates can be held and all those involved given the opportunity to explain the technical justification of their assessments. Such a professional exchange should be the core of a newly designed, consensus-oriented procedure. This procedure not only ensures a higher level of objectivity, but is also much more accessible for the participants than filling out an evaluation form on their own.

The procedure can also be improved by taking greater account of the current status of political instruments at the level of the federal states. In the past, these were not considered in a structured manner. While there are already numerous exchange committees and coordination between the federal and state levels for individual action fields of the DAS, especially in the water cluster, this has not been the case in many areas so far. In order to avoid incoherence, duplication or negative interactions between these levels, the scope of the procedure should be expanded. This could be achieved, among other things, by involving representatives of the federal states in the overall process.

Another starting point for improvement is the collection and pre-selection of particularly innovative and effective instruments. These are usually characterised by a greater "depth of intervention", which can make it more difficult for the network members involved in the process to reach a consensus. The mentioned establishment of subject-specific working groups in the network is one way of improving the integration of innovative, systematic and effective policy instruments. Within these working groups, political instruments can be selected and evaluated in separate discussion and voting rounds before they are presented and accepted in the plenum of the overall network. In addition, people with technical expertise outside the network can be included in such working groups without the size of the group becoming an obstacle to goal- and consensus-oriented discussions.

In addition, it is important to take into account the varying level of scientific knowledge regarding various policy instruments. While there is already scientific knowledge on the mode of action for numerous adaptation measures, this is not yet the case for others. Accordingly, with the latter instruments, more discussion with experts should be encouraged in order to take a closer look at instruments that are less easy to classify in discussion groups.

An addition to the previously used evaluation criteria also represents a possibility for the further development of this procedure. The application of exclusion criteria for adaptation measures (such as the avoidance of maladaptation or coherence with socio-ecological objectives) could also be defined for German climate adaptation measures. Another option here is an approach based on the EU taxonomy for sustainable finance; it applies a "do no significant harm" (DNSH) principle for environmental or social policy goals for all adaptation measures. Such an approach has the potential to significantly increase the coherence of adaptation policy with other political objectives and to avoid negative trade-offs. In addition to this approach, a stronger comparison between the individual adaptation measures in one action field and the other action fields with regard to possible conflicting goals or synergies is recommended.

The feedback from various network partners after completion of the last evaluation process also indicates that a certain amount of prioritisation of the selected policy instruments is desired at the end of the process. Potential implementation options here are the development of a "top ten list" of the instruments considered essential. Alternatively, a temporal prioritisation could be established, which in turn ties in with the urgent need for action identified in the KWRA and takes up the adjustment period documented there.

4.2 Procedure for designing a policy mix

The design of a policy mix for climate adaptation can be based on a wide range of action planning by the federal and state governments. The term "policy mix" primarily refers to the interaction of policy instruments that should be coordinated and complement each other. In this understanding, policy mix is an instrument-oriented expression. This is consistent with the fact that conceptual clarifications on the policy mix of the German climate adaptation strategy have been made, especially for measures and policy instruments (Blobel et al. 2016). Measures are generally the actions required to achieve climate adaptation goals. Measures can include actions of private or state actors or concern actors in the "third sector", which reflects the wide spectrum of non-profit organisations. Political instruments are the possibilities for the state to exert influence so that the necessary actions (measures) actually take place. Policy mix according to this understanding emphasises the interaction of several policy instruments (e.g. the combination of regulatory and informational instruments) for the implementation of necessary measures. The goals of climate adaptation are desired future states that address the

reduction of negative consequences of climate change (or take advantage of the potential associated with climate change).

The instrument orientation of such an understanding of policy mix is entirely consistent with policy design research (in summary Howlett and Mukherjee 2018c, Howlett 2019b). This is why the internationally leading policy design researcher Michael Howlett (2019a) subtitled his short textbook with the phrase "Choosing the Right Tools for the Job." The long version of the textbook (Howlett 2019b) also emphasises the importance of policy instruments through the subtitle "Principles and Instruments". Nevertheless, the systematic consideration of policy design research results in an approach to the design of a policy mix that goes beyond the instrument-oriented understanding. For policy design research, a single policy basically consists of statements about goals and instruments that are formulated on several levels of abstraction. According to this, a single policy is already a complex set of goals and policy instruments that can be broken down into abstraction levels. Policy design research therefore also differentiates policy integration according to goals and instruments and uses different criteria for this (coherence for the integration of goals and consistency for the integration of instruments). This necessarily results in the understanding of policy mix as a combination of at least two "policies", each of which is complex in itself (e.g. the typical six-field matrix per policy, Howlett 2019b, p. 45, i.e. in principle at least 12 fields in combination) and which, ideally, have a high level of political integration, overall coherent goals and consistent political instruments.

Previous projects on DAS action planning have often either completely ignored this understanding of the policy mix (e.g. Blobel et al. 2016) or only partially taken it into account (e.g. Hetz et al. 2019). In the publication on the "Proposal for a Policy Mix for the Climate Change Adaptation Action Plan," Blobel et al. (2016) focus on the combination of steering instruments and measures of climate change adaptation. The fact that a policy mix, according to policy design research, actually requires the combination of at least two "policies" was not systematically considered. Hetz et al. (2019) deal more intensively with the diverse possibilities of designing a policy mix, but do not systematically use the understanding of policy mix according to policy design research for the development of a procedure for the analysis and evaluation of political instruments. Policy integration requirements were reflected in the selection of criteria for the analysis and evaluation of instruments (the criteria of effectiveness, flexibility and efficiency, and above all: coherence and synergy potential, Hetz et al. 2019). With these conceptual clarifications and this brief characterisation of the initial situation, the following formulates some pointers for the procedure for designing a policy mix.

4.2.1 Instructions on how to proceed with individual instruments and combinations of instruments

As mentioned, policy design research is geared to a large extent to the requirements of the overall policy integration of goals and policy instruments in the sense of a mix of several "policies". For the policy and practice of climate adaptation, however, it can be assumed that work on individual instruments and instrument combinations (within a single policy) will also continue to be of great importance. The reasons for this include the following:

- *Additional priorities for analysing the effectiveness of policy instruments:* The Federal Government's second progress report on the German adaptation strategy for climate change emphasises the critical importance of an improved "effectiveness assessment when developing measures for the adaptation action plan". (The Federal Government 2020; p. 52). Analyses of the effectiveness of measures are favoured by the focus on precisely defined

individual possibilities for the state to exert influence. In view of the large number of measures and statements on political instruments in APA III, it will be necessary to focus further on the political priorities already formulated when carrying out assessments of the effectiveness of political instruments, not least in order to keep the expenditure for assessments of effectiveness within a manageable framework (there are also ethical limits to experimental designs in political processes[23]).

- *Careful and flexible approach to instrument combinations:* The network of authorities has increasingly dealt with issues relating to the development of a policy mix for climate adaptation (Hetz et al. 2019). In doing so, it has focused on combinations of instruments rather than a policy mix based on policy design research. The application of the above criteria to selected action fields of climate adaptation led in particular to statements on individual instruments as well as the supplementary (and rudimentary) consideration of instrument combinations. This status of work in the network of authorities suggests a cautious future approach to greater consideration of combinations of instruments. In particular, the question arises as to whether combinations should only be of more systematic importance *after* the analysis of individual instruments (as an "add on" so to speak) or *earlier*. It makes sense to test an early observation of instrument combinations using an example topic or test case in the network of authorities (cf. the test example in Hetz et al. 2019).

Demanding new tasks already lie in an improved assessment of the effectiveness of individual policy instruments and in the increased – and earlier – consideration of instrument combinations in the work of the network of authorities. Even if the understanding of the policy mix is primarily instrument-oriented, numerous new challenges arise. Concrete solutions must be found using appropriate precautions and working methods (taking into account the capacities of the actors involved). The following further raises this level of sophistication by exploring the requirements for designing a policy mix *according to policy design research*.

4.2.2 Guidelines on how to proceed with a policy mix according to policy design research

Improved assessments of the effectiveness of individual instruments and an increased focus on combinations of instruments presuppose that there tend to be coherent target statements between the relevant "policies" – and that questions of effectiveness and consistency are obvious, as a result. For the further development of the DAS action plan in line with the statements of the policy design research, the formulation of clear goals as well as the analysis and evaluation of the coherence of target statements for the clusters and action fields should be given more attention. The central indication of policy design research on how to proceed with a policy mix is that goal and instrument analysis must be systematically separated and then brought together again. Previous efforts on the policy mix for climate adaptation has worked in

[23] One of the most common ethical concerns when estimating the efficacy of an experimental design is the withholding of potentially useful interventions (e.g. climate adaptation measures) from the control group (Lewis 2020). Withholding information or disinformation (e.g. about potential climate risks) from the control group to ensure independence from the experimental context also raises ethical concerns, as this could increase negative effects (e.g. climate damage) and violate the right to self-determination (Lewis 2020). Allocation of appropriate participants to the control group and the group receiving the potentially beneficial treatment, as well as ensuring a controlled experimental design, therefore imposes ethical limits on assessing the effectiveness of interventions with a social context (such as climate adaptation interventions).

this direction (cf. the extensive work on target analysis in climate adaptation in Hetz et al. 2019); however, a systematic differentiation and subsequent integration of target and instrument statements have not taken place. The following section explores the direction that such a policy mix analysis could take according to policy design research and provides two guide lines:

- *Coherence analysis of goals:* The completed procedure for the analysis and evaluation of policy instruments in the network of authorities for the APA III already considers the criterion of coherence for individual instruments. It was examined to what extent there was a contradiction between the expected effect of the instrument and the goals of other federal strategies. This was, therefore, a question of the possible, unintended negative side effects of the instrument. This test was carried out verbally and argumentatively. There were no systematic, content-specific target statements as guidelines for completing the coherence check of an instrument (such as in the case of the use of "Sustainable Development Goals [SDGs]" and concrete target statements derived from them ["targets"]). Policy design research suggests replacing this kind of rudimentary, minimal coherence analysis with a more systematic analysis that compares target statements at multiple levels of abstraction in multiple policies and examines their relationships. A process on SDGs *and* targets can lead to a maximum programme of coherence analysis for targets. It is characteristic of the maximum programme of the coherence analysis that the DAS action planning aims for a deductively determined and representable system of targets. The target system would include *all* clusters and action fields would be formulated in a comprehensible way on the three levels of abstraction: policy, programme and measures. It should also provide positions *between* a minimum and maximum programme of the coherence analysis of targets. For example, there is the option to limit the ambition of formulating a coherent system of objectives to the "water" cluster.
- *Consistency analysis of instruments:* Even coherent goals for climate adaptation can lead to inconsistent combinations of instruments if instruments develop effects under changed framework conditions that were not taken into account when they were introduced (so-called "drift" as changed effectiveness due to changes in the framework conditions of instruments as well as inconsistency of instruments due to the insertion of new instruments into an existing programme). The consistency analysis of instruments therefore addresses the connection between instruments, on the one hand, and the framework conditions under which they develop their effectiveness individually and in combination, on the other. This can also include the previously used criterion of synergy potential. The criterion of synergy potential refers to the extent to which climate adaptation effects can be expected in other DAS action areas. The criterion of synergy potential in this way addresses the possible positive side effects of an instrument.

According to policy design research, the consideration of a policy mix should lead to extensive changes in the previous procedure for the analysis and evaluation of policy instruments in the network of authorities. Changes mainly affect two starting points in the DAS action plan: (1) the formulation of the target statements on the three abstraction levels (policy, programme and measures); and (2) the analysis and design of a coherent target system – either for the DAS action plan as a whole or for individual clusters and action fields. Taking into account the coherence of goals and the consistency of instruments across several – i.e. at least two – policies means that the assessment process as a whole and in principle has to be re-addressed. However, some elements will presumably be included in a new process in a more or less modified form.

It should also be noted that a modified approach to policy mix design according to policy design research does *not necessarily* lead to a highly modified presentation of the results of the work of

the network of authorities as a contribution to action planning for adaptation. For example, APA III basically follows the principles of the policy mix (e.g. through the integrative orientation towards clusters, e.g. water). What is striking is the combination of more technical statements, which are presented very condensed in tabular form, with a textual or argumentative presentation of the "political focus". In the second progress report and APA III, however, target statements on climate adaptation have not yet been assigned any particular importance. A modified approach to policy mix design based on policy design research does not necessarily imply that the design of DAS reports will change. However, target statements systematically play a greater role *in the process of working out* plans.

4.3 Stakeholder involvement and participation processes in the development of a policy mix

So far, there has been no consistent involvement of actors outside the network of authorities as part of the DAS processes. Currently, only selective participation exists in the form of dialogue formats, including the national dialogue on the consequences of climate change in Germany. It has already been mentioned that involving a wide range of stakeholders in the action planning process can improve the policy design of climate adaptation policies. Various factors speak in favour of establishing a permanent, institutionalised process for involving stakeholders in the process of developing the APA.

The already clearly visible, sometimes devastating effects of climate change in Germany illustrate the need for the timely and effective implementation of adaptation measures. In some cases, especially in the case of those measures that have a high level of intervention or are part of a transformative adjustment, these will be associated with sometimes strong conflicts of interest. In order to be able to take up and address these conflicts at an early stage, appropriate space is needed; this can be created by a stakeholder committee that meets regularly. The long-term involvement of a wider range of actors can make a critical contribution to placing the APA and adaptation policy as a whole on a broader societal basis.

In addition, the results of the KWRA show that, in relation to various climate impacts, the possibilities of transformative adaptation to climate change should be considered. Strong changes and innovations are associated with this type of adaptation. Both developments are driven in practice by different actors (pioneers and promoters). The development, implementation and dissemination of transformative adaptation measures can only take place through actor constellations that combine different resources and competencies (Heyen 2019). The networking and integration of relevant actors is therefore repeatedly emphasised in the context of a transformative (adaptation) policy (e.g. Heyen 2019 and Fedele et al. 2019).

The establishment of a stakeholder forum with the associated work processes represents a way of institutionalising and consolidating this integration of and coordination with relevant actors. Such a body can ensure the permanent participation of representatives of the municipalities, federal states, civil society and business. In terms of the composition of a stakeholder forum, the selection of participants should be systematic and transparent. Based on a general query as to which actors would like to get involved in such a process, a selection can then take place to ensure that all relevant stakeholder groups are represented.

The vision process documented in the second progress report is a good way to ensure the permanent involvement of stakeholders. Such a process requires the participation of a number

of actors in different phases, using appropriate formats. This opens up an opportunity to continue the network of actors that emerged in this process and to integrate it into the policy design process at various points. The vision process can in this way serve as the foundation for a permanent, structured participation process of adaptation policy by a stakeholder committee.

Using the objectives of stakeholder forums in other policy areas, it is possible to come up with guidelines as to which objectives can be processed with such a format. The primary task of this type of committee is usually to clarify the facts on complex issues and to make recommendations for action. These recommendations can contribute to the optimisation of a policy mix in climate adaptation.

The establishment of such a body includes various aspects that are to be defined in advance by the IMAA. This includes the desired composition of the body, the definition of tasks and work output, the option of coordination by an office, the frequency of meetings and reporting to the IMAA. In ongoing phases of the establishment and later the work of a stakeholder committee, the appropriate formats must be adapted to the process and the intended results. Throughout the participation process, it is necessary to define clearly and transparently how the input developed by such a body is taken up and used for the decisions of the IMAA. This transparency was brought forward in various discussions as central to the success of structured stakeholder participation. Another important success factor of effective cooperation within the framework of a joint policy design process is regular, ongoing exchange between the IMAA and the stakeholder committee. In the analyses carried out, this was seen as an important component of successful coordination processes. Other success factors include a clear objective of the body and coordination by an office or steering committee.

In order to ensure that this body works effectively, it is advisable (depending on the number of members) to anchor topic-specific cooperation in various working groups. In this way, relevant specialist knowledge can be bundled. For example, working groups can be set up for various clusters or action fields of the DAS; these groups can develop instrument proposals for the APA, formulate opinions, and make recommendations. These groups can also have points of contact with the work of the network of authorities. In this way, the results developed by the stakeholder committee, such as statements on proposed instruments, can be presented and discussed at network meetings.

The outputs of the individual working groups should be discussed at regular intervals in the plenum of the entire committee in order to create a coherent overall process. By being divided into topic-specific working groups, detailed questions can be discussed and external experts can be consulted where necessary. The experiences of various analysed stakeholder participation processes also show that larger conferences, such as those already part of the DAS process, can be supplemented by smaller event formats in order to offer different opportunities for input.

The ongoing involvement of stakeholders described here, in combination with supplementary dialogue processes, represents a sensible improvement to the DAS process and can increase its legitimacy, acceptance and visibility.

4.3.1 Potential improvements in the network of authorities

The analyses of various political strategies and the scientific literature as well as the reflections on the previous work of the network of authorities provide insight into a number of potential improvements for this body.

This includes the establishment of technical and thematic sub-networks that can consolidate the exchange of content on certain action fields of the DAS and focus the work on the relevant action fields. At this point, a link to a possible new stakeholder committee could also be established. In this scenario, the network of authorities as a whole and the network meetings primarily serve the purpose of comprehensive exchange, the discussion of work results from the individual sub-networks and joint coordination. Such sub-networks can improve topic-specific cooperation, simplify coordination processes and pool specialist knowledge. In addition, these sub-networks can also integrate relevant actors outside the network. This applies in particular to the participation of representatives of the federal states in order to improve the coordination and integration of different levels of measures at this point.

Before such new developments in the Network of Authorities for Climate Change and Adaptation can be defined more precisely or implemented, it is necessary to define the objectives and the self-image of the network and its work. In this regard, the question arises as to whether the network primarily fulfils an advisory or participatory function. Since the network of authorities can be understood both as an expert network and as an implementation network, the dividing lines are not always clear here. This can lead to varying understanding of tasks as well as conflicts. The clarification of this (self-)understanding is therefore recommended. It is conceivable, for example, to formulate formal or informal rules of procedure, similar to the Bioeconomy Council, that lay down the basic ideas on the network's goals, working methods and quorum. For the work processes of the network of authorities, it must be clearly communicated how the respective input of the participants is used. The clear objective of the coordination processes in the network should always be to find a consensus. However, should this not be achievable in certain cases, consensus and dissent can be described in the respective outcome papers.

4.3.1.1 Increasing the ambition of the network of authorities as a governance network

The Network of Authorities for Climate Change and Adaptation tends to be understood as an implementation network (i.e. as a "service delivery and implementation network", see Table 14 above). However, by fulfilling the task of contributing to the analysis and evaluation of policy instruments for the development of APA III, the network of authorities has also taken on the characteristics of a governance network. The extent to which the network of authorities is understood as a governance network is of great importance for the use of politically legitimate target statements for climate adaptation. An implementation network is highly dependent on political targets, which should include all levels of abstraction of target statements (i.e. the levels of policy, programme and measures). A governance network could be given more scope in formulating independent target statements for the analysis and evaluation of policy instruments.

Only target statements on climate adaptation that have been developed in the individual departments, and then coordinated across departments (planned for a round mid-2023), make it possible to clarify whether target statements of sufficient quality are available that enable the network of authorities to actually function as an implementation network. In addition to policy integration at the federal level, this also involves federal-state-municipal coordination. It may be possible to gain insights from the current implementation of the "Ordinance on Federal Spatial Planning for Transnational Flood Protection (BRPHV)" from 19 August 2021 that are important for the DAS overall.

4.4 Improving the integration of different vertical levels

The DAS is a complex strategy process, horizontally and vertically. Horizontally, this complexity results from the large number and variety of action fields for climate adaptation, as outlined in the central strategy document from 2008 (The Federal Government 2008). Vertically, this high level of complexity results from the different spatial-institutional levels of the DAS and the actors who play central roles at these levels.

Policy design research has developed an understanding of the policy mix that corresponds precisely to this high level of complexity. It should be noted that the policy field of climate adaptation has established itself with regard to specific problem perceptions, actors and institutions (cf. Vetter et al. 2017); less pronounced, however, is the *unique instrumental character*. For example, APA III's frequent mention of policy instruments for flood risk management and heavy rain risk management as examples of climate adaptation instruments is striking.

The core of optimised policy integration in climate adaptation is the coherence of measures at different levels. The federal, state and local governments are involved in climate adaptation in various ways and are essential for the successful implementation of adaptation activities. So far, however, there has been a lack of binding structures to ensure the coherence of the individual activities. One way of counteracting this is the already mentioned inclusion of the state level in the work of the network of authorities. Such an approach could achieve the optimised coordination of the APA with adaptation measures at the level of the federal states. In some subject areas (e.g. water), such coordination is already taking place in various bodies; this is not the case in many other areas, however. An improved coordination process is required.

In addition, a stronger link to the needs of the municipalities should be established and taken into account when planning action at federal level. One possibility is offered by the work of the newly established Centre for Climate Adaptation (ZKA). There, the needs of the municipalities are recorded centrally. At the same time, municipalities are informed about ongoing processes and possible participation opportunities at federal level. At this point, it would be possible to start with comparatively little effort, for example to obtain statements from municipal umbrella organisations.

4.5 Importance of a new vision and target definition process

"As part of this target formulation, the IMAA will develop a vision for a climate-resilient Germany in 2060 with a horizon of 2100 in cooperation with the federal states; in doing so, it will also take into account the key dates of the EU adaptation strategy. As part of the vision for a climate-resilient Germany, specific, comprehensible and verifiable goals for climate adaptation are named for the individual action fields." (Second progress report on DAS, The Federal Government 2020; p. 44)

The second progress report states that a process for formulating the vision of a climate-resilient Germany in 2060 is to be implemented. Part of this process will be the definition of clear objectives for adaptation policy (The Federal Government 2020). The outcomes of this process will have implications for climate adaptation policy design and policy mix through various channels.

The formulation of goals at different levels of abstraction (e.g. according to the three levels of policy, programme and measures, see Chapter 2) is a key component of strategy development in

general, and in the public sector in particular. According to the report (cf. The Federal Government 2020; p. 52), it should be noted that the previous climate adaptation strategy has mainly either specified general goals ("policy" level) or contains very specific goals for individual measures (cf. Action Plan III). There is a need to formulate target statements that are *measurable*, (also) *binding* and *strategically* significant (i.e. relate more to the level of programme development, cf. Chapter 2). In general, not enough importance has been given to the challenges of formulating goals in the DAS action plan (cf. e.g. Figure 1 in the second progress report on the DAS, The Federal Government 2020; p. 7).

Currently, however, the development of measurable targets for climate adaptation in the federal departments is taking place on the basis of agreements within the framework of the IMA adaptation. It is to be expected that internal and cross-departmental processes for the development of goals for climate adaptation will entail new challenges for strategy development. This applies, for example, to the question of the coherence of target statements when they are developed in very different action fields and the departments affected. This also applies to the revision of the means of presentation for the DAS (e.g. illustrations and figures for the reporting of the DAS). The increase in ambition when formulating goals can be understood as the key challenge for further strategy development.

A central influencing factor on the action planning process is the clear direction given to a mix of measures by such a vision and specific, verifiable goal definitions. At various points in this research project, a clearly defined objective from the beginning was mentioned as a decisive success factor for the planning and policy design process.

Alongside a vision for climate adaptation and tangible targets, the effectiveness of measures, policy instruments and policy mixes can also be analysed much better as part of an action planning process. This promotes the formulation of a particularly effective policy mix. In previous selection and evaluation processes, a lack of such targets led to difficulties in recording the effectiveness of measures because the corresponding reference point was missing. The process initiated by the progress report promises improvements here. Depending on the timing, this can already be relevant for the development of the APA IV, so that instrument proposals that are evaluated by the members of the network of authorities can be assessed with regard to their effectiveness in relation to verifiable target definitions. The mentioned effects of a vision and setting goals therefore promise support for an optimised consolidation of the instrument proposals and promote clearer framework conditions for an improved design of a policy mix.

The vision could also be supplemented by so-called guiding principles, which give the planning of measures a further conceptual framework. This can include, for example, the compatibility of measures with the SDGs or the preference for nature-based solutions in climate adaptation. This would specify the basic requirements that political instruments and measures must meet in order to become part of a new policy mix.

This vision process also plays a role for transformative adjustment and the selection of measures with high transformation potential, since long-term visions are an important prerequisite for a successful transformation process (Jacob et al. 2019). Here, too, visions fulfil the function of a common goal alignment for adaptation measures.

In addition, such a vision can represent a connecting, overarching component for a newly created stakeholder process. A common goal supports the integration of different levels of action and actors involved in the policy design process. Involving a larger number of stakeholders in the selection of adaptation measures can be a difficult task to coordinate. A vision that is backed

by tangible goals fulfils an important function here, in order to give the process a clear orientation and focus and to ensure that the large number of activities are aimed in the desired, direction. In addition, measures from various action fields of the DAS can be bundled more easily behind a target definition and vision.

This orientation and consolidation function of a common vision and a clear target system is also important for the optimised vertical integration of adaptation policy. The measures taken by actors at different levels can in this way have a uniform orientation. The prerequisite for this is that the results of the vision process are not only relevant for the federal level, but also include all levels.

A prerequisite for these potential optimisations with the help of a vision and a target system for climate adaptation policy is that the targets are formulated in a comprehensible and tangible way and that a wide range of relevant stakeholders are involved in the formulation process from the start in order to ensure ultimate ownership by all those involved.

5 Conclusions and synthesis of the recommendations

The issue of adapting to the unavoidable effects of climate change has become increasingly important in recent years – not least since the devastating floods in western and southern Germany in July 2021. The challenges of climate adaptation policy have arrived in political and social awareness.

It is all the more important to critically examine the processes and institutions of climate adaptation policy and identify optimisation potential. This report has used various methodological analyses to show where such potential lies and, based on this, made recommendations for the further development of the DAS and related processes.

For example, policy design research offers useful information through the systematic development of a typology of types of a policy mix, which has not yet been comprehensively considered in the development of action plans in climate adaptation. By considering the distinction between instrument mix and policy mix, an improved systematic understanding of the goals, instruments and measures that make up a policy mix can be achieved.

From the comparative analysis of the DAS with a number of policy strategies at federal level, numerous aspects can be derived that appear suitable for transfer to the policy field of climate adaptation. The permanent involvement of a larger range of stakeholders can be an essential factor for an optimised foundation for the APA. If necessary, this could be achieved by expanding the network of authorities to include relevant stakeholders. Alternatively, another committee could supplement the network. Key success factors for evaluating and selecting policy instruments for action plans could also be identified. These include primarily the transparency of the procedure and the methodology from the beginning of the process. A common, uniform understanding of the evaluation criteria is also key. With regard to the steering process of strategies and its importance for the development of a catalogue of measures, the analysis revealed that one of the most common challenges is ensuring the effective coordination of the individual measures and aligning the numerous activities in a targeted manner. These challenges, some of which are also present in the DAS process, can be met by realigning them along missions, guiding principles or core projects, as described on the previous pages.

For the further development of the Network of Authorities for Climate Change and Adaptation, points of contact can also be identified from the comparative policy field analysis. In this context, it will be important to develop a common goal and understanding of network cooperation and to communicate this both internally and externally.

Recommendations for the improvement of the DAS

The recommendations formulated in this report for the further development of the DAS are aimed at various aspects of adaptation policy. This includes the evaluation and selection processes for adaptation measures for the APA, the processes for involving stakeholders in the development of a policy mix, and improving the integration of different levels.

For the selection process of adaptation measures, the report highlights the benefits of an integrative approach and advocates expanding the scope of stakeholder involvement. Involving a wider range of actors increases the quality of adaptation planning and a broader acceptance of the measures. In addition to the selection process, the report recommends strengthening participatory processes to involve stakeholders in the entire action planning process and other DAS processes. The establishment of a stakeholder forum with the associated work processes represents a way of institutionalising and consolidating this integration of and coordination with

relevant actors. The ongoing involvement of stakeholders described here in combination with supplementary dialogue processes represents a sensible improvement to the DAS process and can increase its legitimacy, acceptance and visibility.

For the selection of new policy instruments and measures within the framework of an optimised policy mix in climate adaptation, a detailed consideration of the existing measures is also required. Otherwise, so-called "layering" can occur, in which new instruments and combinations of instruments are added to existing policy instruments without an overarching view of possible interactions and the long-term consistency between them (Ekvall et al. 2016). In order to avoid this, the results of the KWRA can be consulted, as the urgent and very urgent requirements for action derived there clarify the gaps in existing adaptation planning, which should be the focus when selecting new instruments. Furthermore, a selection of prioritised core projects is recommended in order to be able to deal with specific measures in a focused manner and to increase the visibility and accessibility of the adaptation policy.

Another suggestion for improvement concerns the (vertical) integration of different levels. In order to avoid fundamental questions of vertical political integration that are difficult to answer, it is advisable to identify suitable example topics that can be used to demonstrate a possible coordinative approach. In addition, the level of the federal states can be involved in the work of the network of authorities in order to achieve optimised coordination of the APA with the adaptation activities taking place at state level. In this context, a stronger link between the needs of the municipalities and action planning at the federal level would also be advocated.

As a final aspect within these recommendations for the further development of the DAS, a clearly defined objective is highlighted as a decisive success factor for the planning of measures. This facilitates coordination between the political levels and the actors involved. Tangible key goals are essential, especially for the initiation of far-reaching transformative processes in climate adaptation.

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