Local climate protection - benchmarks, partnerships, guidelines for local governments

Hans Hertle, IFEU Heidelberg, Germany
The Institute for Energy and Environmental Research (IFEU) is a non-profit ecological research institute. It was founded in 1978 as an independent center of excellence for environmental research by scientists from the University of Heidelberg. Currently, IFEU has a staff of more than 70, mostly scientists in the fields of biology, chemistry, physics, geography, and engineering.
IFEU: Different perspectives on environmental impact

**Consumption perspective** and **Production perspective**

Carbon footprint / Energy Balance of Cities / EMAS Industries / LCA Products
Agenda

- History of climate cities action
- Climate Cities Benchmark
- Klimaschutzplaner (Excursus: Allocation of CHP)
- Coaching kommunaler Klimaschutz
- Change Agent Course (Klimaschutzdialo)g
- Personal Carbon Footprint
Germans had been shocked by oil embargo 1973

They had been shocked by high price of gasoline but even by the ban on driving
(Sonntagsfahrverbote auf Autobahnen)

“Conservation is the quickest, cheapest, most practical source of energy. Conservation is the only way we can buy a barrel of oil for a few dollars.”

Jimmy Carter, “Sweater and Sacrifice” Speech
Climate Cities on the road since the early 1970th

Encouraged by environmental touched citizen some big cities startet with efficiency programs and promoted renewable energy installation

(and not only shifting from coal to oil or to natural gas)

http://www.klimabuendnis.org/repowermap.html?&L=1
More and more small cities and regions want to switch to 100% renewable energy

(German feed in law started in 2000)
Citizens form cooperatives to drive the energy transition

Number of energy cooperatives in Germany, 2001-2011

Source: AEE in energytransition.de
Just now: 100% Masterplan > Ambitious goals for cities

Goal: Reducing energy consumption until 2050 by 50%

Goal: Reducing greenhouse gas emission until 2050 by 95%

ENERGIEWENDE: It seems to work...
...but it is rather complex
How to compare climate cities action and help them tuning climate measures on multi-plane level?


CO₂ emission are caused by different effects
Staring only at CO₂ in total may be not useful

Annual change of CO₂ emission within given period (base: consistent calculation method)

Source: IFEU, Balancing these cities
So we need some more indicators

The Set of Indicators covers:
- CO$_2$-Emission
- Renewables
- CHP
- Efficiency
- Mobility
- and Reduktion of Waste
Set of indicators should base on absolute figures

The set shows an absolute scale! 10 points is excellent (e.g. 0 tons CO₂ or 100% Renewables)

The blue beams indicate the city
The flags indicate German average
Set of Indicators can be used in the long run

The set of indicators figures out long term goals based on scenarios.

It is even useful for 100% Masterplan Cities with ambitious goals until 2050.
Elements of Climate Cities Benchmark

Activity Profile →

Sponsored by →

↔Balance Sheet

Set of Indicators→

www.benchmark-kommunaler-klimaschutz.net
### Activity profile: Multiple joice (4 step approach)

<table>
<thead>
<tr>
<th>A</th>
<th>Climate Policy</th>
<th>1: getting started</th>
<th>2: moving forward</th>
<th>3: forging ahead</th>
<th>4: taking the lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Adopt targets and develop a concept</td>
<td>develop a general commitment to climate policy</td>
<td>add a self committing CO2 reduction target for the city or municipality</td>
<td>adopt detailed reduction targets for all relevant sectors</td>
<td>develop visions, set high targets (e.g. become a “100% renewable” community)</td>
</tr>
<tr>
<td>A2</td>
<td>CO2-Monitoring (measure, verify and report performance)</td>
<td>prepare the implementation of a CO2 inventory and Greenhouse Gas Balance (Check data availability) for municipal facilities or estimation for the municipality</td>
<td>accomplish a CO2 inventory for the city according to fuels and multiple sectors including municipal facilities</td>
<td>publish a report about the implementation of the action program with data of energy consumption and a rough CO2 inventory of all sectors</td>
<td>regularly monitor indicators relevant to the climate through a benchmark system (Climate Cities Benchmark, eea, etc.)</td>
</tr>
<tr>
<td>A3</td>
<td>Institutionalise your climate policy</td>
<td>determine a responsible officer / department for climate policy</td>
<td>inform and involve all relevant departments and decision makers in your climate policy</td>
<td>set up a global administrative department for climate protection in the municipality</td>
<td>establish a climate protection agency (including city departments and external stakeholders)</td>
</tr>
<tr>
<td>A4</td>
<td>Set up and implement the action programme (define visions)</td>
<td>establish an action programme including basic resolutions and identify possible measures</td>
<td>select priority measures and realize first measures taking into account previous activities and upcoming developments in your municipality</td>
<td>detail the action program for all sectors relevant to the climate in accordance with the targets set</td>
<td>intensive implementation of the action program with measures in all sectors (incl. traffic sector)</td>
</tr>
<tr>
<td>A5</td>
<td>Inform about climate change and your climate policy</td>
<td>organize a public event on climate protection and the local commitment</td>
<td>set up an annual campaign on climate change</td>
<td>regularly inform and raise awareness for specific target groups in at least one sector</td>
<td>elaborate a target group-specific information and communication strategy for target groups in all relevant sectors (incl. traffic sector)</td>
</tr>
<tr>
<td>A6</td>
<td>Involve local actors</td>
<td>set up an structures and models for participation and involvement of stakeholders</td>
<td>establish a permanent working group / round table on climate policy with citizens, individual target groups and stakeholders</td>
<td>enforce structures by carrying out first pilot projects based on active co-operation with citizens, individual target groups and stakeholders</td>
<td>set up long term cooperation with private sector partners, stakeholders and individual target groups (e.g. large energy consuming, supply, transportation or waste companies)</td>
</tr>
<tr>
<td>A7</td>
<td>Open up to the region and initiate common activities</td>
<td>Engagement in international networks for climate protection</td>
<td>set up cooperation with neighbouring municipalities to discuss the potential of common activities in the climate sector</td>
<td>common planning and implementation of regional climate protection activities</td>
<td>set up regional climate action programs including regular monitoring of energy consumption or CO2 emissions</td>
</tr>
</tbody>
</table>

www.ifeu.de/index.php?bereich=ene&seite=climate_partnership

Hans Hertle  | October 11th, 2013  | 19
Balance sheet: Lack of harmonized calculation

Based on different approaches you may get diverging results

- Reference (100%)
- Source onsite: -25%
- Final energy: +11%
- Regional data: +21%
- Degree days: -3%
- CO2 pur: -11%

Source: Leitfaden Kommunaler Klimaschutz
Harmonized calculation method in progress

"Development of standardized instruments for balancing energy, potential and scenario,"

Partner:
Klima-Bündnis e. V.
Frankfurt

Institut dezentrale Energietechnologien
IdE Kassel

Time schedule:
Mai 2012 until April 2015
First results (stationary - 9/2013)

- Basis: Final energy within city boundaries
- CO₂-equivalent and process chain
- National grid (caldinal calculation)
- No climate correction (cardinal calculation)
- Allocation of CHP by exergetic calculation (see below)
- Quality of data must be reported

- For information only:
  - non energetic emission
  - buing green electricity
  - investment outside city boundaries
  - compensation
Interpretation on the long run is necessary

Energy use and other data of the city
Example 2000 to 2010

- Consumption (real)
- Consumption (degree days)
- Gross Domestic Product
- Inhabitants
- Living area

2000 = 100%

www.klimaschutz-planer.de
Hans Hertle
October 11th, 2013
Exergetic calculation method: Focus on sustainable energy systems (e.g. LowEx system or energy cascade)

Transformation of district heating systems can be calculated by the exergetic method (Carnot - Methode)

The „finnish“ method is not suitable!
Start up for newcomer
„Coaching kommunaler Klimaschutz“

- Smart and quick access
- Practical Guidance by standardized methods and good practice
- Free of charge for all communities
- www.coaching-kommunaler-klimaschutz.net

Partner:
Klima-Bündnis e. V. DUH
Frankfurt Deutsche
Ravensburg Umwelthilfe

Time frame: 2010 - 2012

Supported by

Starter set

Portfolio of measures in 8 fields of action

- Energy management
- Energy production
- Mobility
- Urban planing
- Public relations
- Procurement
- Global responsibility (partnership)
- Funding

www.coaching-kommunaler-klimaschutz.net
Concept light (Schnellkonzept)

How to manage the concept light

Opening meeting
Participation
External support

Content of the concept light

Energy balancing
Saving potential
Catalogue of Measures

Tools
Checklist, Sample, Survey / link to other device
# Tools e.g. Checklist of Status quo

**A1 Checklist Energy Management**

<table>
<thead>
<tr>
<th>ja</th>
<th>nein</th>
<th>Themengebiet / Frage</th>
<th>Wertung (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Energiebeauftragter und Organisation</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es eine zentrale Koordination der Aufgaben zum Thema Energie (Energiebeauftragten)?</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ist die Aufgabenverteilung des Energiemanagements schriftlich festgehalten?</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sind alle bei Energie- und Sanierungsfragen relevanten Ämter und Hausmeister eingebunden?</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es Berichtsverantwortliche zum Thema Energie?</td>
<td></td>
</tr>
</tbody>
</table>

**A2 Checklist Institutionalization**

<table>
<thead>
<tr>
<th>ja</th>
<th>nein</th>
<th>Themengebiet / Frage</th>
<th>Wertung (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ziele und Strategien</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Politisch kurz- und mittelfristig verankerte Klimaschutzziele (z.B. bis 2020 oder 2025)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es ein CO₂-Einsparziel der Kommune?</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es ein Energieeinsparziel der Kommune?</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es Ziele im Bezug auf den Ausbau Erneuerbare Energien?</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es Ziele im Bezug auf den Ausbau von Kraft-Wärme-Kopplung?</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es Ziele zu Einsparung von Endenergie/CO₂ in kommunalen Gebäuden?</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gibt es Ziele für die Anpassung an die Wärmespeicherhalle?</td>
<td></td>
</tr>
</tbody>
</table>
Tools e.g. Activity Profile (small)

Activity Profile (status quo)

- Energy management
- Institutionalization
- Mobility
- Public relations
- Urban planing
- Global responsibility
- Energy supply
- Procurement

Coaching Kommunaler Klimaschutz
Capacity building „Klimaschutzdialog“
Change agent course for local climate action „heroes“

Within the framework of „climate dialog“ (Klimaschutzdialog - Prozessoptimierung, Kommunikation und Mobilisierung im kommunalen Klimaschutz)

Time frame: 2013 to 2015
Commissioned by Bundesumweltministerium (BMU)
Supported by „Nationale Klimaschutzinitiative“
Change agent course

- Pilot course (just running)
- Course north 2013/2014 (fully booked)
- Course south 2014
- Course middle/east 2014/2015

Partner
At the end climate change building may be ready but...
...even citizens have to hit the target!

TAKE THE FOOTPRINT CALCULATOR!


http://ubahcarahidup.blogspot.de/2008/07/change-your-lifestyle-concept.html
Balancing your own CO$_2$e emissions

- Calculation of single person or household
- Comparison with German average and acceptable quota
- Balancing even for single fields of needs
- Public consumption is fixed on the short run
- Yearly updating and recording possible
- Offline version for scientific project available
Range of carbon footprint

- Public consumption
- Life style
- Nutrition
- Air travel
- Public transit
- Private car
- Heating
- Electricity

Yuppie single city: 18 tons CO₂e per year and person
Family rural area: 14 tons CO₂e per year and person
Eco family city: 10 tons CO₂e per year and person
Average: 6 tons CO₂e per year and person
And don´t forget

„Was du nicht messen kannst, kannst du nicht lenken“
Peter Ferdinand Drucker (1909-2005)
US-amerikanischer Ökonom
und Pionier der modernen Managementlehre

Thank you for your attention