Web-based tools for the calculation of personal environmental balances

Fabian Scherer, Consultant ECOSPEED

Content

ECOSPEED

→ **ETH Zürich Spin-Off**

→ **Software developer providing solutions in the field of energy, environment and climate change mitigation**

→ **Mission to help our clients reducing their environmental footprints**
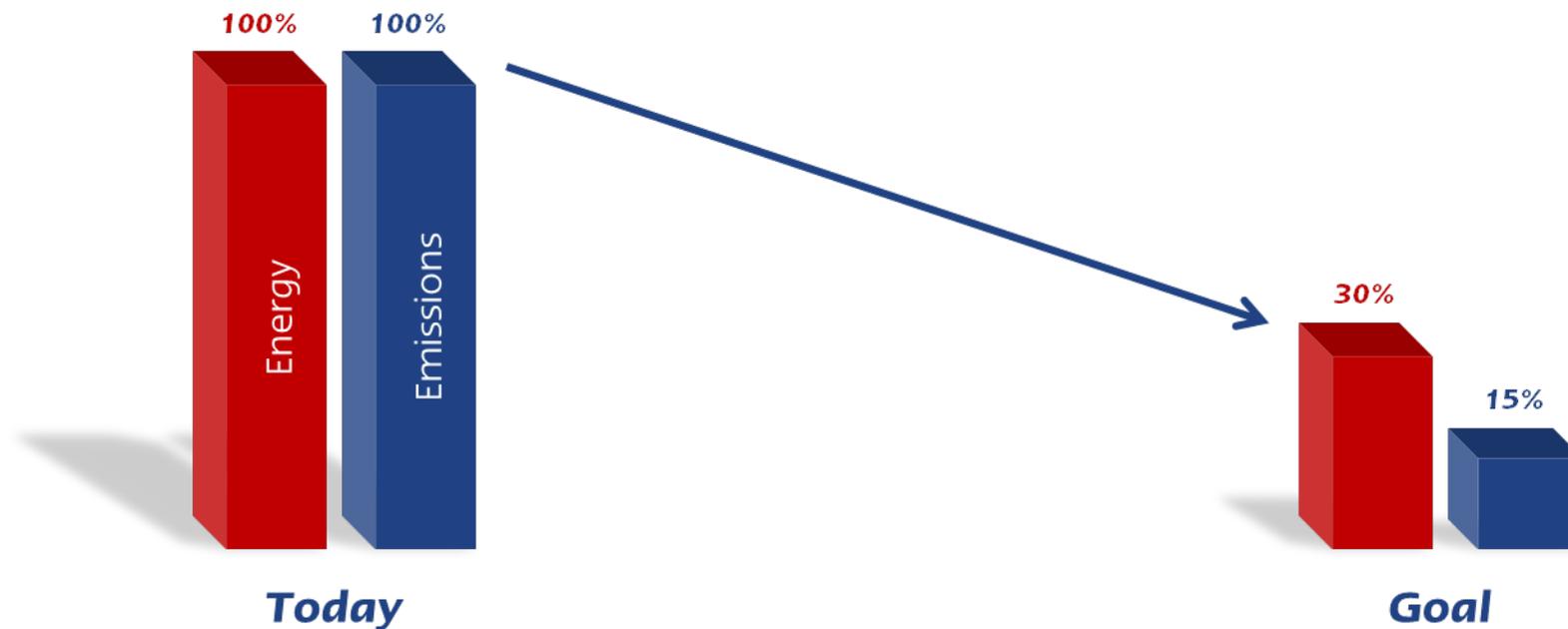
ECOSPEED Software on the Scale

ECORegion   **ECOBusiness**   **ECOPrivate**

| Global | Nations | Cities | Districts | Associations | SMEs | Events | Households | | Processes |
| Continents | | Municipalities | | Industries | Enterprises | Projects | | Individuals | Products |

Large-scale   **Small-scale**

Territorial footprint   Organizational footprint   Personal footprint
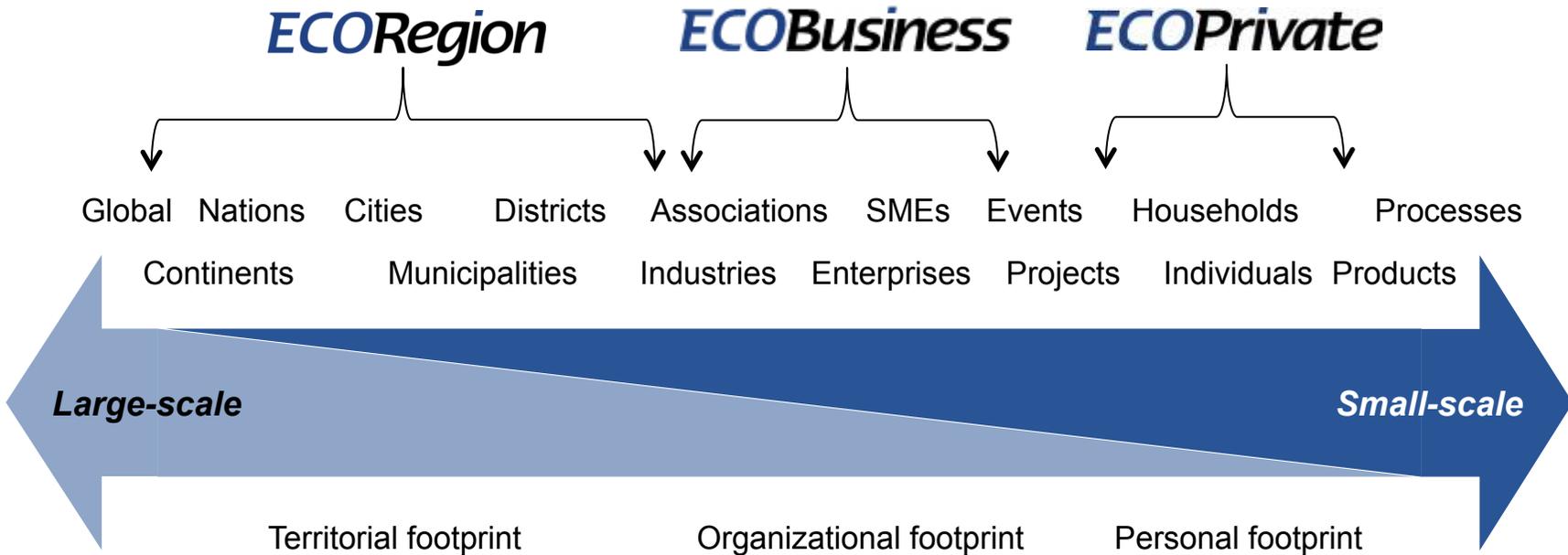
References:
ECORegion & ECOBusiness

- **ECORegion, 1000 customers, the leading solution for territorial energy and GHG balances in Europe:**

  - **Examples of cities**: Zurich, Bern, Basel, Winterthur, Lausanne, Bonn, Berlin, Frankfurt, Stuttgart, Munich, Hannover, Kaiserslautern, Dresden, Leipzig, Dusseldorf, Dortmund, Paris, Rom, etc.

  - **Examples of community solutions**:
    1 Nation (Swiss cantons), 1 German state (North Rhine-Westphalia), 2 German administrative regions, 45 German administrative districts etc.

- **ECOBusiness, successfully deployed by SMEs and major enterprises:**

  - **SMEs (more than 50)**: Messe München, Städtische Werke Grenchen, Elektrizitätswerk Obwalden, Night Star Express, STAWAG etc.

  - **Major clients (1 billion $ turn over)**: Waters (USA), Panalpina (CH), Modus Link (USA) more to be added soon

Development of sold licences
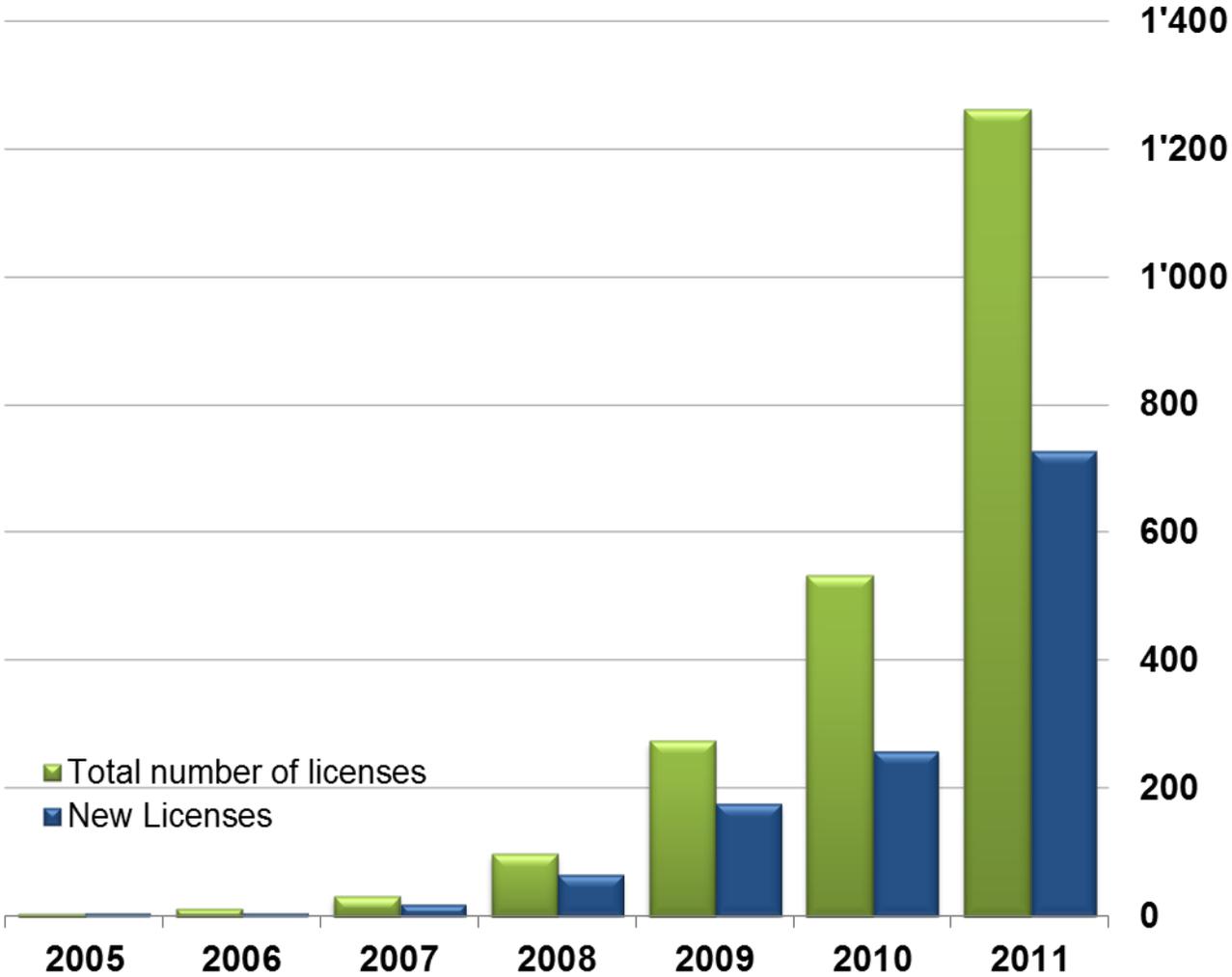
Content

1. ECOSPEED Products & References

2. ECOPrivate

3. Market development & Trends

4. Visions

5. Discussion

ECOPrivate History

- **Launched in 2001 as tool to calculate a personal GHG emissions and primary energy footprint**

- **Financed by Novatlantis, BAFU and BFE**

- **Implementation was supervised by ESU-Services**

- **ECOPrivate was one of the first of its kind and therefore:**
  - Copied all over the world
  - Cited in and used for peer reviewed publications and many studies

- **Goal to create a tool which allows to compare different consumption options:**
  - High uncertainty for absolute numbers
  - Comparably good precision in relative differences between different consumption categories

ECOPrivate Approach I

- **LCA Indicators: primary energy (cumulative energy demand) and GHG emissions**

- **User-specific data can always be compared with average data**

- **Activity intensities can be selected**

- **Reduction options are given**

- **Activities are:**
  - assessed within 13 process and
 - grouped into 4 activity categories, which are **heating**, **appliances, mobility, nutrition and consumption**

Result Presentation ECOPrivate
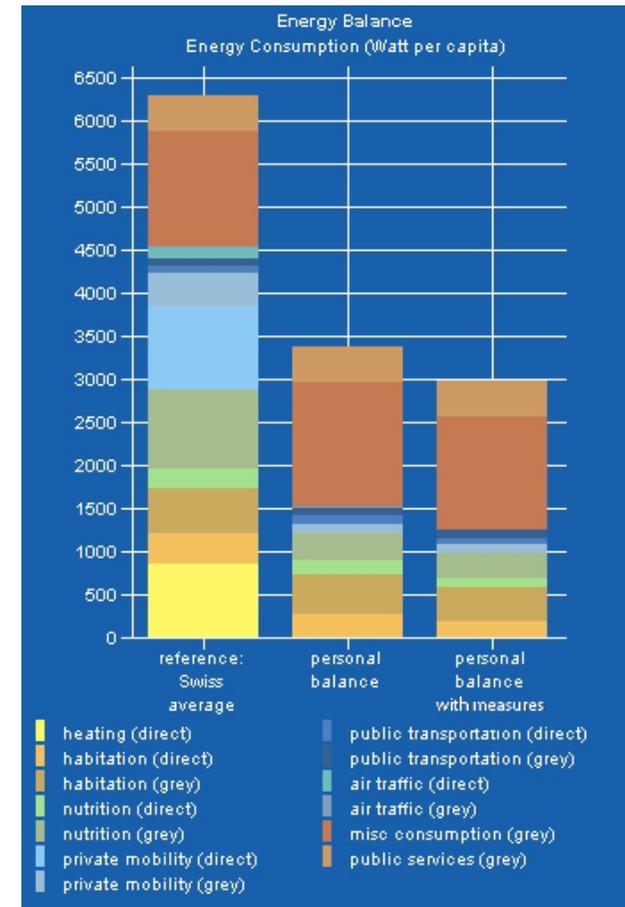
ECOPrivate Approach II

- **Input-output approach based on energy and material flow import-export statistics**

- **All goods are attributed to 28 economic branches and «baskets of goods»**

- **Model was implemented 2000 based on statistics from 1995-1998**

- **In 2000 available LCA-data was used to attribute emissions and cumulative energy demand to baskets of goods and energy consumption**
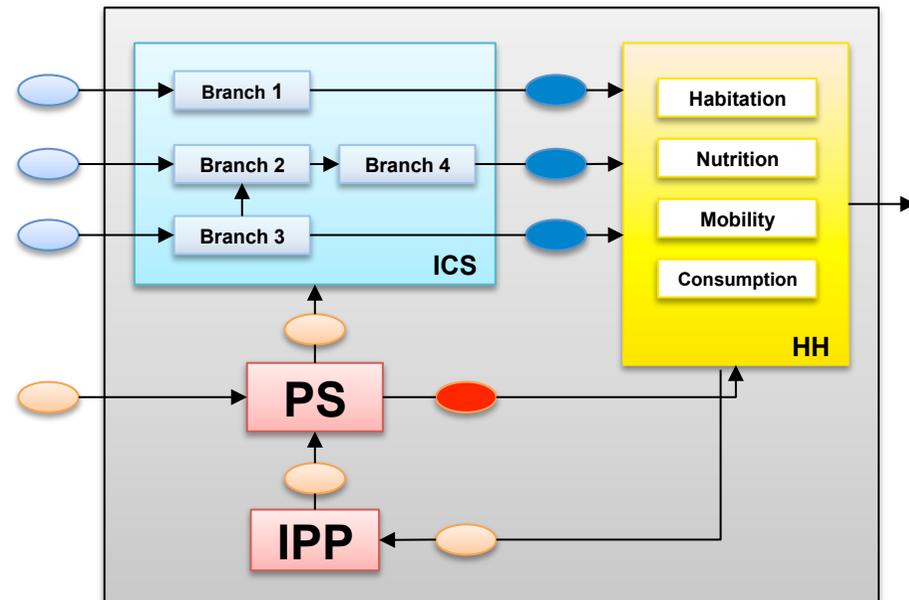

Legend:
ICS: Industry, commerce and services
HH: Private households
PS: Power supply
IPP: Inland power production

ECOPrivate Approach III

- **User-options based on statistical data and saturation assumptions or assumed variation (+/- percentage)**

- **Total of 6300 Watt per Person for Switzerland**

- **Total would be around 8000 Watt per Person with current consumption levels and LCA-data**

- **A minimum of 2000 Watt per Person can be reached with drastic measures**

- **The estimated uncertainty for the statistical data is 10-15% and   for the LCA-data 30%**

ECOSPEED | Slide 11
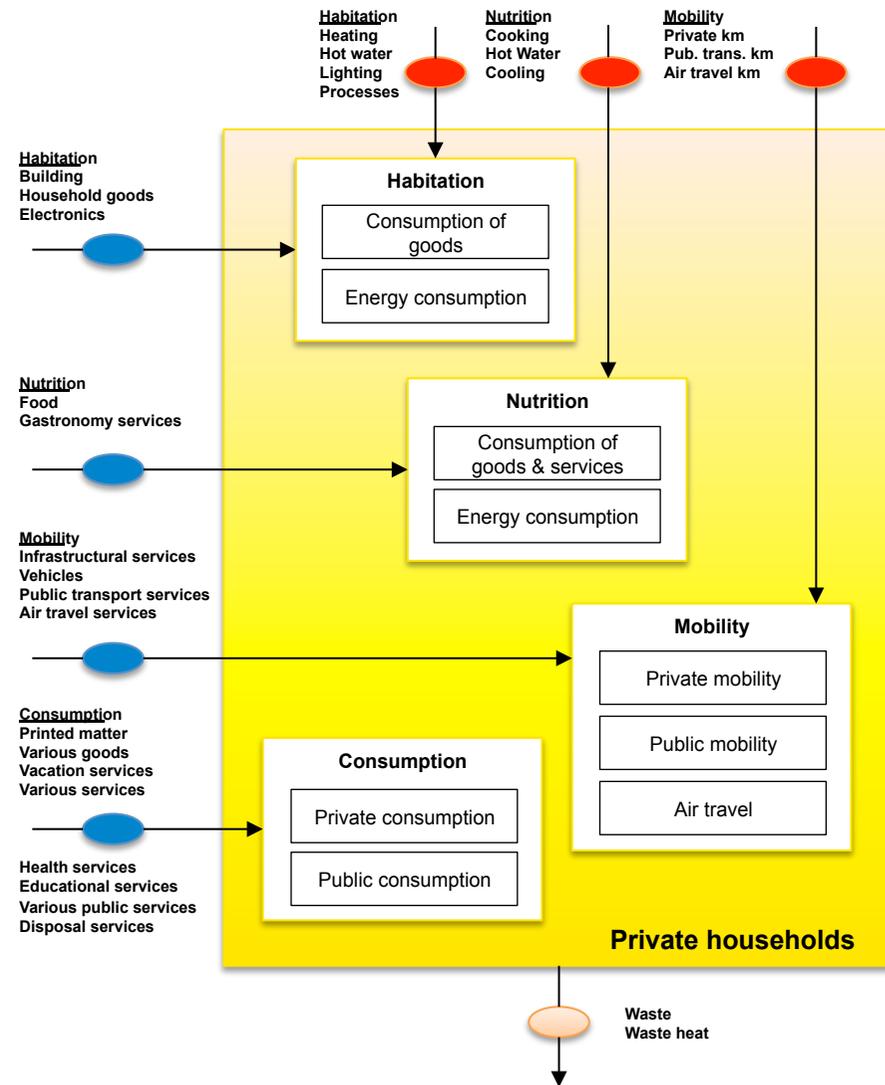
ECOPrivate References

- **ECOPrivat has been used by over 30'000 visitors in 2011**

- **The commercial version includes:**
  - User management
  - Functions for saving and comparing different datasets

- **Examples of commercial projects are:**
  - Environmental Survey Neuchatel – 380 participants during 3 years
  - Novartis – Hit the Light, 28'000 participants within 6 months
  - Energiesparwoche Canon – 6000 participants within 1 month
  - Klimafrühling Stadt Zürich – 550 participants
 - 20-Years-anyversary econcept – 23 participants

Monat	Unterschiedliche Besucher	Anzahl der Besuche	Seiten	Zugriffe	Bytes
Jan 2011	1893	2183	7951	159063	1.55 GB
Feb 2011	2203	2647	9497	192183	1.83 GB
März 2011	3071				
Apr 2011	2187				
Mai 2011	3916				
Juni 2011	2475				
Juli 2011	2096				
Aug 2011	2249				
Sep 2011	2673				
Okt 2011	2489				
Nov 2011	3034				
Dez 2011	2379	2982	10959	264726	2.27 GB
Total	30665	37106	133906	3079582	29.37 GB
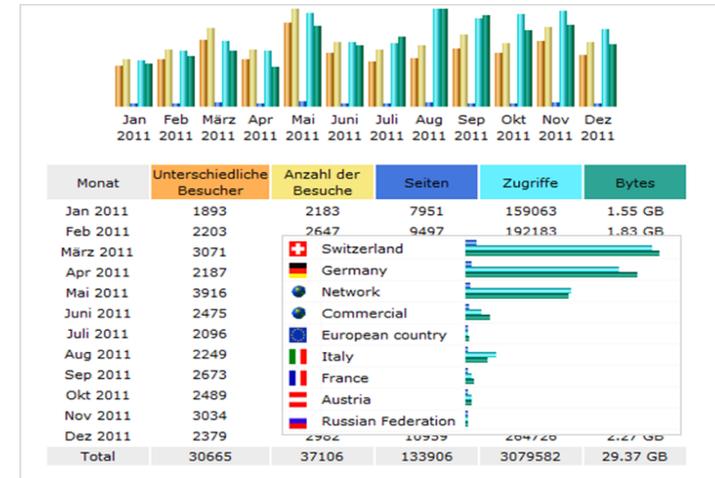
Next Steps & Possibilities

- **Update LCA factors and the data model of ECOPrivate based on current studies**

- **Redesign the graphical interface**

- **Use advantages of development platform meta@space:**

  - Flexible timeline

  - Customizing possibilities

  - Country specific datasets

- **Integrated data usage of other ECOSPEED solutions**

- **Etc.**
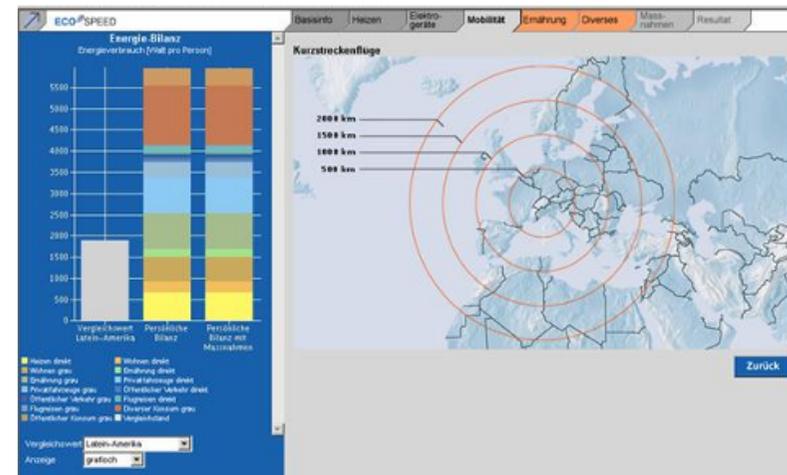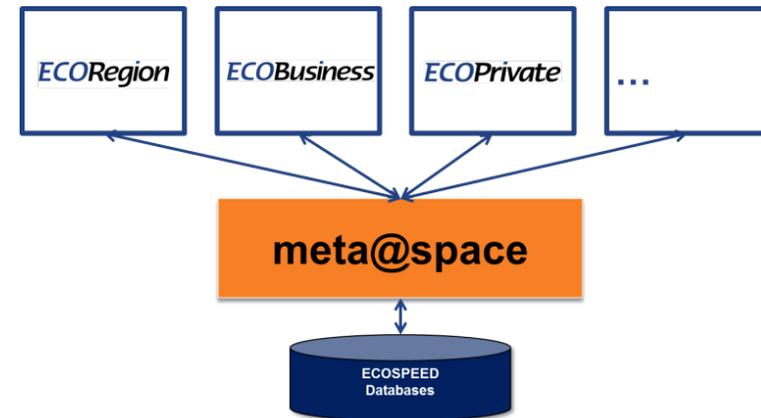
Content

1. ECOSPEED Products & References

2. ECOPrivate

3. Market development & Trends

4. Visions

5. Discussion

Market Development & Trends

Awareness-raising & Education

Decision Support & Specific Applications

Monitoring & Measurement
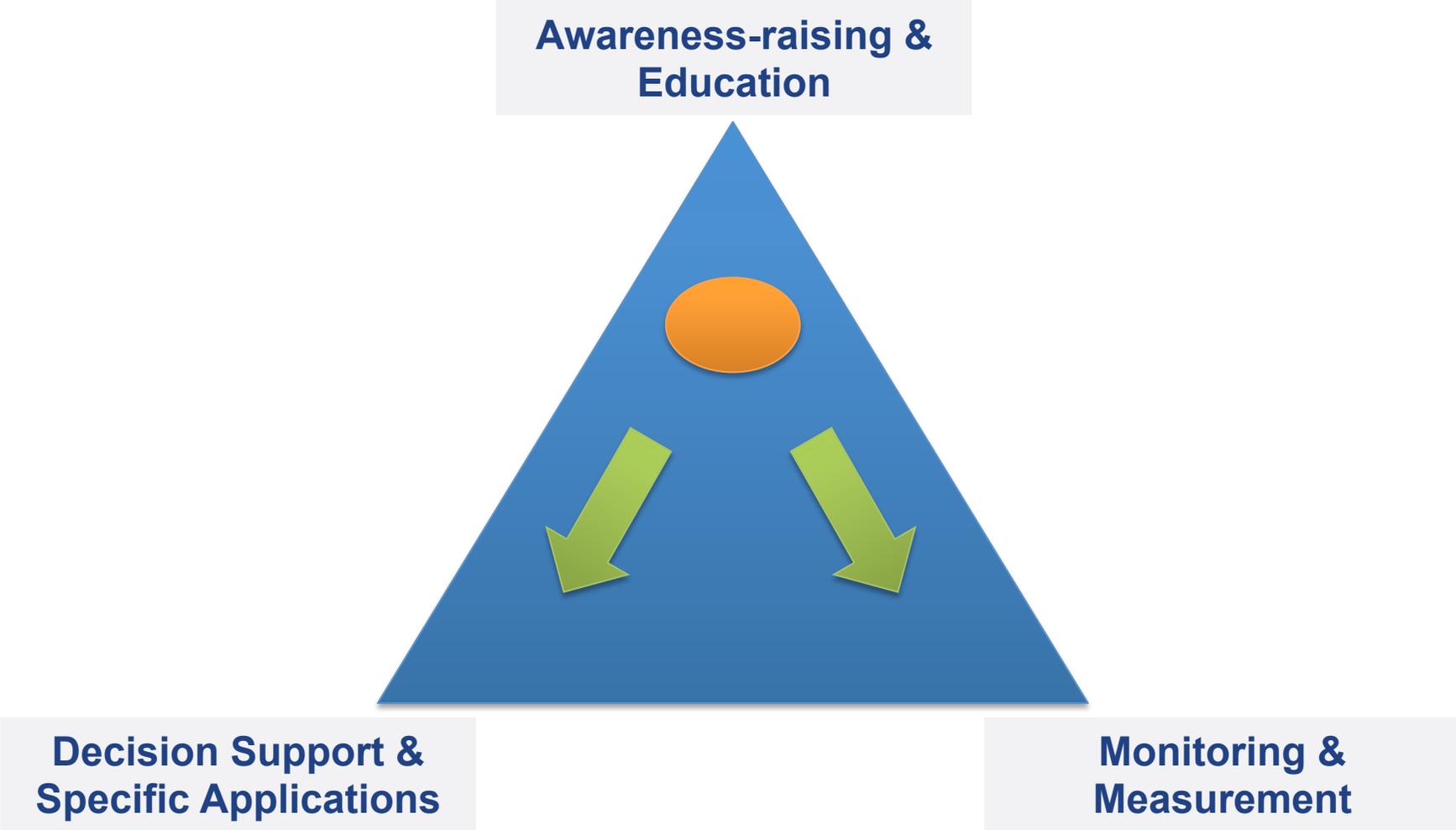
Awareness-raising & Education

- **Tool Characteristics**

  - Holistic approach including all major areas of consumption an activities

  - Mostly focused on energy and GHG emissions

  - Designed for usage by a broad range of user types

- **Trends**

  - Data availability and quality are bettering: usage of EIO-LCA-data and hybrid approaches

  - Apps and mobile applications

  - Integration of decision support, measures, scenarios and monitoring capabilities

- **Examples**

  - ECOPrivate (2001), ECOSPEED SA, www.ecospeed.ch

  - CoolClimate Carbon Footprint Calculator (2012), University Berkeley, http://coolclimate.berkeley.edu

  - Klima-Rechner (2011), UBA, http://uba.klimaktiv-co2-rechner.de

  - EcoGuru (WWF), http://ecoguru.panda.org

  - Etc.

Decision Support & Specific Applications

- **Tool Characteristics**

  - Focus on a specific subject of consumption or activity: Mobility, food, air travels, technologies etc.

  - Focus on specific environmental assessments: Water footprint, UBP etc.

  - Extended predefined measures and decision support based on quantitative assessments

- **Trends**

  - Integration with business applications

  - Apps and mobile applications

- **Examples**

  - Water footprint calculator http://www.waterfootprint.org

  - Ecopassenger http://www.ecopassenger.com/

  - Atmosfair (air travel), www.atmosfair.de

  - Food Carbon Emissions Calculator www.foodemissions.com

  - Etc.

Monitoring & Measurement

- **Tool Characteristics**

  - Focus on monitoring of energy consumption

  - Direct measurement of consumption

  - Driven by smart metering and utilities

  - Integration with building management systems

- **Trends**

  - Usage of monitoring data in other applications

  - Integration with business applications

  - Apps and mobile applications

- **Examples**

  - UK
    first:utility, «Smart Online Account», Software by Opower, http://opower.com
   www.first-utility.com/home-energy/smart-online-account

  - USA
    Green Button Initative
    www.greenbuttondata.org/
    www.energyai.com/
    www.gasandpower.com/
    www.greenbuttonconnect.com/
    etc.

Content

1. **ECOSPEED Products & References**

2. **ECOPrivate**

3. **Market development & Trends**

4. **Visions**

5. **Discussion**

ECOSPEED Vision:
Integrated Solutions

1 ECOBusiness → Data → ECOPrivate

2 ECORegion → Data → ECOPrivate

3 ECOBusiness → Data → ECOPrivate
ECORegion → Data →
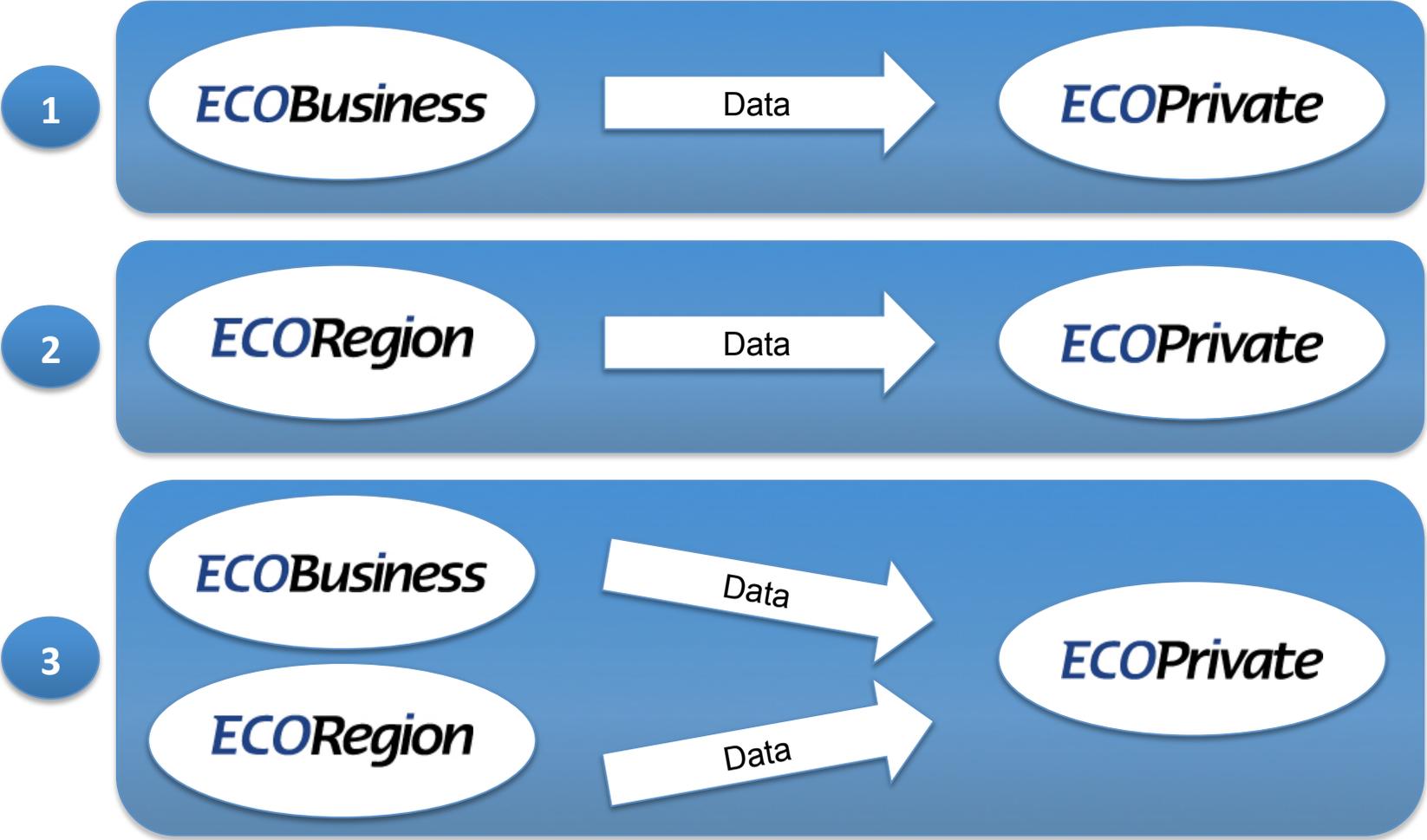
ECOSPEED Vision: Combination with Monitoring

- **Integration of a holistic personal environmental balance with continuous monitoring data**

- **Combination of yearly perspective for all areas of consumption with a monthly, weekly, daily perspective for certain fields of consumption**
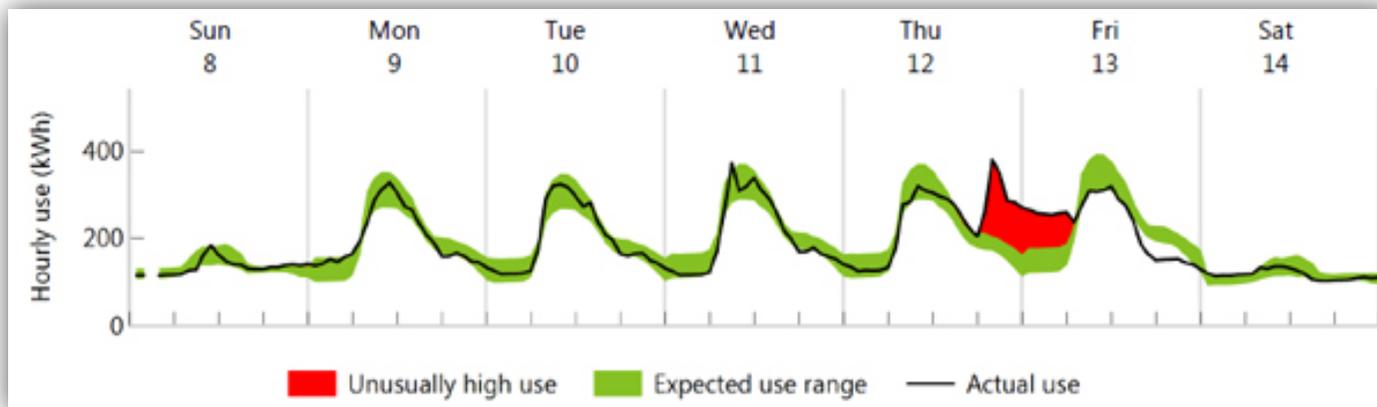
Content

1. ECOSPEED Products & References

2. ECOPrivate

3. Market development & Trends

4. Visions

5. Discussion

Discussion

- What new applications do you foresee for web-based tools for the calculation of personal environmental balances?

- Where are opportunities for the integration of personal environmental balances into business applications?

- Do you think integration of holistic footprinting tools with smart metering and other monitoring data brings a benefit?

- Etc.