CO2 reduction from Household Consumption by PSS

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Structure

- Introduction on SusProNet
- Household Consumption - Priorities
- PSS options per priority
- Reflection
Why was SusProNet set up?

• 2000: 6 institutes took the initiative to set up and EU Network on Ecodesign
  – TNO - Econcept
  – CfSD - INETI
  – VITO - O2 Global Network

• 2001: EU accepted the proposal if changed to Product-Services

• Runs between May 2002-end 2004
What do we want to reach?

• ‘Thematic Network’: focus on
  – Exchange of best practice and identification of research needs
  – Building a lasting network of researchers and practitioners
• SusProNet does this for Product-Services
How is it organised?

• Central partnership:
  – 7 co-ordinators, leading the Work Packages and Workshops for
    • 32 direct participants (mainly industry)
    • participants from 6 other EU ‘Cluster’ projects, who develop in total 17 PSS
• Broader virtual practitioner network: via conferences, website, newsletter etc.
How is it organised (2)

• Main lines:
  – 5 best practice studies in sectors/Need areas
    – Base materials/chemicals
    – Information/communication
    – Offices
    – Food
    – Households
  – 1 overall best practice study

• User- and network building oriented
  – best practice ‘guided’ by industry participants
  – a.o. via 3 workshops and 3 conferences
Project structure

WP 3-6: Management (TNO-STB), Website, dissemination (O2), etc.

WP 1: General State of the Art (Econcept, TNO-STB)

WP 7: Base Materials (INETI)

WP 8: Information and communication (CfSD)

WP 9: Offices (Econcept)

WP 10: Food and retail (TNO-Industry/Kathalys)

WP 11: Households (VITO)

WP 12: Workshop 1 (M8)

WP 13: Conference 1 (M12)

WP 14: Workshop 2 (M16)

WP 15: Workshop 3 (M20)

WP 16: Conference 2 (M24)

WP 2: Cluster dissemination (TNO-STB)

PSS methodology
work of Innopse, Prosecco, Lean services

17 PSS cases of Innopse, Prosecco, Brainfridge, ASP-NET, PROTEX, IPSCOM

(TNO Kathalys, CfSD, INETI, VITO, O2)
SusProNet after 2004 – What Heritage?

- SusProNet will end as a network of 100-200 people with links worldwide (US, Australia, Japan)
- This should not fall apart -> Heritage WP
- Options include (most actors already involved in SusProNet):
  - Continue under umbrella of O2 Global
  - Continue under Prepare
  - Continue as a broad global network of various cooperating actors (e.g. UNEP/UNIDO, O2, …??)
- To be elaborated in 2004
Energy use by Households

• Direct energy use:
  – Heating/cooking
  – Electricity
  – Fuel for cars

• Indirect energy use:
  – Life-cycle energy consumption for goods bought

• Data from various studies (Moll and Noorman, Slob, etc.)
## Energy use by Households

<table>
<thead>
<tr>
<th>Need area or function</th>
<th>% direct/indirect, Groningen average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feeding</strong></td>
<td>18%</td>
</tr>
<tr>
<td># Feeding, indirect</td>
<td>13%</td>
</tr>
<tr>
<td># Feeding, fossil (cooking c.a.)</td>
<td>1%</td>
</tr>
<tr>
<td># Feeding, el. (fridge c.a.)</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Shelter</strong></td>
<td>39%</td>
</tr>
<tr>
<td># House</td>
<td>4%</td>
</tr>
<tr>
<td># Household goods/services</td>
<td>6%</td>
</tr>
<tr>
<td># Shelter, fossil (heating c.a.)</td>
<td>26%</td>
</tr>
<tr>
<td># Shelter, el. (light c.a.)</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Clothing</strong></td>
<td>6%</td>
</tr>
<tr>
<td># Clothing, indirect</td>
<td>2%</td>
</tr>
<tr>
<td># Clothing, el. (wash c.a.)</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Personal care</strong></td>
<td>8%</td>
</tr>
<tr>
<td># Personal care, indirect</td>
<td>2%</td>
</tr>
<tr>
<td># Personal care, fossil (hot water)</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Leisure, education</strong></td>
<td>10%</td>
</tr>
<tr>
<td># Education</td>
<td>2%</td>
</tr>
<tr>
<td># Leisure</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>18%</td>
</tr>
<tr>
<td># Transport, indirect</td>
<td>8%</td>
</tr>
<tr>
<td># Transport, direct fuel</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>
Priorities

- Shelter, direct – 30% (heating, lighting)
- Clothing, direct – 4% (washing)
- Personal care, direct – 7% (tap water)
- Feeding, indirect – 13%
- Transport, (in)direct – 8+10%

Total 70 to 75 % of direct/indirect energy use
Types of PSS

Value mainly in product content

Product-service system

Service content (intangible)

Product content (tangible)

Value mainly in service content

Pure Product

A: Product oriented
1. Product related
2. Advice and consultancy

B: Use oriented
3. Product lease
4. Product renting/sharing
5. Product pooling

C: Result oriented
6. Activity management
7. Pay per service unit
8. Functional result

Pure service
Types of PSS

- We discern 3 main groups PSS, with 8 sub-types
  1. Product-oriented services
     - Product-related service (e.g. maintenance contract, financing)
     - Advice and consultancy (e.g. courses, factory design)
  2. Use oriented services
     - Product lease
     - Product renting and sharing
     - Product pooling
  3. Result-oriented services
     - Activity management (= CMS ??)
     - Pay-per unit of use (e.g. copiers)
     - Functional result (e.g. promising no crop loss instead of pest control)

- Each has his own economic and sustainability characteristics
Market success depends on

– Market value (tangible and intangible)
– Production costs (including risk premium)
– Capital/Investment needs
– Good position in value chain now and in future?
PSS – Shelter/personal care, clothing

1. Heating and tap water
   a) ‘Good climate offer’ (6, 8) - 🙁 ,
   b) Advice on energy saving (2) - ☺,
   c) Leasing/renting solar cells, etc. (3) 😊

2. Electricity use
   a) ‘Energy management (8) 😞
   b) Sharing hobby apparatus (4, 5) 😊

3. Clothing/washing
   a) Laundry service and Napkin service (6) 😊
   b) Pay per wash of Electrolux (7) 😞
Shelter/personal care, clothing - conclusions

• Many PSS result in consumer sacrifices
• Some have little added environmental value (pay-per-wash, laundry service)
• Other instruments (building regulations, labelling of washing machines) have had much more effect than can be expected from PSS (?)
PSS - Food

• PSS types:
  1. Vegetable subscription service (6,8)
     a) Niche market: ☺
     b) Main market: 😞
  2. Convenience food (6,8) ☺
  3. High quality catering (6,8) ☺
Food, conclusions

• PSS is becoming important due to trends as less time, small families, etc.
• However, probably NOT automatically contributing to sustainability.
• Vegetable subscription for average consumer a sacrifice
PSS-Transport

- **PSS types:**
  - Car leasing/renting (3)
  - Package holidays (6, 8)
  - Public transport (7,8)
  - Car sharing systems (4,5)
    - Niche market
    - Main market:
Transport, conclusions

• Again
  – PSS that do not help environment thrive
  – PSS that do (car sharing) is confined to niche markets
Overall conclusions

• About PSS:
  – Some help sustainability, some not
  – There is often a trade-off between sustainability and consumer sacrifice (e.g. pooling, sharing)

• About reduction of energy use
  – Look at it case by case; sometimes PSS is effective, sometimes another measure
Do not mix cause and effect

• Function oriented- *thinking* is good for system design (of which a business model follows)
  – Helps to think out of the box, focuses on function
  – These degrees of freedom help to design a Factor 4/10 system
  – And then to develop the necessary incentive structures and business models

• But do not expect that a function-oriented business model on its own *designs a Factor 4/10 system* !!!!!
To be continued!

Join SusProNet its process at

www.suspronet.org
How will we do this?

• Now – install a ‘Mirror group’ per Need area
  – Open for everyone
  – Actively asked to contribute/comment on interim products
  – (Maybe) low-profile meetings back to back existing events
  – Subscribe at www.suspronet.org (already 30+)

• Future - (in SusProNet heritage ?)
  – New need areas?
  – Topic-oriented or cross-cutting groups?
  – A bit broader than PSS (‘Functional approach’)?
Product related services (1)
Advice and consultancy (2)

• Relatively easy to implement
• Useful if the provider can do the activity more efficient than the client itself
• Marginal changes in systems; hence marginal environmental improvements
Product lease (3)

- Provider: incentive to prolong life
- User: not always incentive for careful use
- Result might be environmentally negative (e.g. lease cars)
Renting and sharing (4)
Pooling (5)

- High environmental gains due to very intensive product use
- Additional gains since access is more difficult and use hence discouraged
- This results often in a low tangible and particularly intangible value for users
Activity management (6)

- Works if provider can be more efficient than user
- Environmental gains if efficiency is gained on materials, not HR
- Generally no radical system changes -> limited environmental gains
Pay-per used unit (7)

- Overcomes split incentive between user and provider
- In practice average environmental gains
- Again, generally no radical system changes
Functional result (8)

- High sustainability gains possible (new system)
- But the problem is often risk:
  - Provider takes responsibility for the result
  - Functional results too abstract to find good performance indicators
  - Provider can’t always control that the result is reached, or the costs involved
A review

• Economic
  – Renting, sharing, leasing: (in)tangible value
  – Functional PSS: risk and liability issue

• Environmental: see table

<table>
<thead>
<tr>
<th>PSS type</th>
<th>Impacts compared to reference situation (product)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Worse</td>
</tr>
<tr>
<td>1: Product related service</td>
<td></td>
</tr>
<tr>
<td>2: Advice and consultancy</td>
<td></td>
</tr>
<tr>
<td>3: Product lease</td>
<td></td>
</tr>
<tr>
<td>4: Product renting and sharing</td>
<td></td>
</tr>
<tr>
<td>5: Product pooling</td>
<td></td>
</tr>
<tr>
<td>6: Activity management</td>
<td></td>
</tr>
<tr>
<td>7: Pay-per unit use</td>
<td></td>
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<tr>
<td>8: Functional result</td>
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</tr>
</tbody>
</table>
Conclusions

• PSS are no panacea for Factor 4/10
• Economic/environmental win-win is often a myth
• Most PSS types have just marginal improvements
• Only functional PSS and maybe renting, sharing and pooling will do the trick
  – Risk and liability issue
  – Tangible and intangible sacrifices