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#### *Findings from the 1<sup>st</sup> Advisory Board Meeting*

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#### **Abstract:**

This Deliverable sums up the proceedings and major findings derived at the 1<sup>st</sup> S3C-Advisory and Dissemination Board Meeting, which took place in Brussels on September 12<sup>th</sup> 2013 and was visited by the consortium as well as 14 members of the Advisory and Dissemination Board that shared their expert knowledge and experience from practice.

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## Executive Summary

The first Advisory and Dissemination Board meeting of the S3C project took place in Brussels on the September 12<sup>th</sup> 2013. After an introduction to the S3C goals and strategies, 14 ADB members from various professions and backgrounds gave the consortium their input concerning passive and active partner selection, tool development and end-user engagement techniques.

In the matter of project selection, the consortium was advised to consider involving more small self-funded projects in order to better estimate the long-term effects of the project.

Furthermore, the members of the Advisory and Dissemination Board provided the consortium with a list of Do's Don'ts and Don't Knows concerning end-user involvement based on their experiences on the topic.

In developing a toolkit website for the S3C project, the ADB members saw the main difficulties in addressing several target groups through one website and in whether the content of the website should be static or continuously updated. A strong consensus was achieved on including a user platform on the website to enable visitors to exchange information and seek open dialogue.

In a workshop on end-user involvement schemes, several trends that are currently practised were identified, including engaging regional or social communities, gaming, smart billing, ambient tools, social networks, etc.

Visions for future schemes in end-user involvement included several gadgets (robots, house developer, etc.), 'energy flat rates' and a stronger emphasis on gaming, social networks and the end-user identification with 'their' grid.

The second ADB meeting is planned for April/May 2014 and set before the tools will be implemented in the participating projects. Additionally, it was decided to hold a workshop with members of S3C's sister project 'ADVANCED' between January and April 2014 to compare preliminary results.

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## Chapter A: Introduction and Review

### 1. Introduction of the ADB members

The Advisory & Dissemination Board consists of 17 members from a broad range of backgrounds that include engineering, technical and social/ psychological sciences.

The following members were present at the first ADB meeting in Brussels on the 12<sup>th</sup> of September 2013:

**Table 1: Present ADB members**

Name	Organisation	Role/Background	Advise for the Consortium
Gernot Hagemann	hannoverimpuls GmbH	Regional innovation management; special focus on regional energy management	It's all about the money; brings experiences from Hannover.
Michael Hübner	Austrian Ministry for Transport, Innovation and Technology	Ministry representative, responsible for planning and coordination of Smart Grid programmes, coordinator of the ERA-net Plus programme, Austrian ISGAN representative	Successfulness of smart energy is based on attracting people.
Wolfgang Teubner	ICLEI – Local Governments for sustainability	Managing director of ICLEI association, development of a number of international urban development projects	Input on climate and energy protection on the urban level – territorial aspect.
Dr. Tiit Kallaste	Stockholm Environment Institute (Tallinn branch)	Research director focusing on energy and climate policy implementation, sustainable energy development in the Baltic and new member states	Organizer of the EnergyWise Week
Mohamed al Marchohi	Social-Economic Council of Flanders	Member of advisory body and think tank SERV specializing in socio-economic feasibility of sustainable housing	Would like to see the benefit of activating smart customers/ consumers.
Dr. Julia Seixas	Faculty of Science and Technology at Universidade Nova de Lisboa	Geographic Information Technologies, Energy, Environment and coordinates research on Modeling in Energy and the Environment, and Environmental Remote Sensing, co-founder of E.Value	Look at specific target groups: gender, income, age, etc.
Paolo Landi	Fondazione Consumo Sostenibile	President of Adiconsum and coordinator of many EU projects on energy; member of the working group of DG Sanco on “consumers energy transparency”; member of the working group of DG Energy on “energy and vulnerable consumers”	A relation between energy and people has to be built.
Dr. Carlos Rosa	UNIDCOM (IADE) at Lisbon University	Lectures about the psycho-sociology of consumption, interested in marketing research, economy and societal issues around consumption	The driver to change behaviour is open dialogue.
Prof. Américo Mateus	UNIDCOM (IADE) at Lisbon University	Creativity and innovation consultant for several business companies in Portugal and Belgium, specialises in territorial branding and innovation ecosystems	Multi-channeled communication is the key – not everyone can deal with technology.
Heidi	Smart Grids	General Manager of the Smart Grids	How can SMEs be

Lenaerts	Flanders Platform	Flanders platform, coordinates academic and industrial level, institutions from Flanders in the field of innovative energy research	reached? How will we increase the quantity and quality of people's thoughts about energy?
Dr. Ruth Mourik	Duneworks consultancy	Master's Degree in Anthropology and Sociology, Master's Degree in Society and Technology Studies, PhD in risk communication, controversy analyses and public participation, research and consultancy projects specialize in sustainability projects.	Is interested in finding the right tool to engage people in smart energy.
Marina Lombardi	Enel	Project coordinator of ADVANCED	Interaction with and involvement of the end-users are keys.
Prof. Cecilia Katzeff	Swedish Interactive Institute	Doctor of psychology, her work experience covers research as well as practical work within the design of IT from the perspective of users. Her research focuses on design and development of digital artifacts and services in behavioral change related to the use of energy in various contexts.	Focus in daily life is not on energy use in Western countries; People in countries with unstable political situations are more aware of energy.
Prof. Igor Papic	University of Ljubljana, Laboratory of Electricity Networks and Devices	Expert on active distribution networks, specializes in efficiency and technical integration of RES/DER	There is potential in the networks – best customer for energy is the system operator.

The following ADB members were not present at the meeting, but are still involved as active ADB members and wish to join the consortium for the next meeting:

**Dr. Maher Chebbo (SAP):** Vice President of Utilities and Media department of SAP France and member of EEGI, Technical coordinator of SEESGEN-ICT, Steering Committee DG-Energy Task Force Smart Grids Regulatory

**Prof. Ronnie Belmans (KU Leuven):** Focuses on techno-economic aspects of power systems, power quality and distributed generation; CEO of EnergyVille (joint venture research centre for sustainable energy supply of cities), Executive Director of Global Smart Grid Federation

**Saskia Müller (Amsterdam Smart City):** Programme manager at the Amsterdam Smart City programme, Amsterdam Smart City Philosophy centres around Open Infrastructures and bottom up innovation

**Jürgen Stetter (E.ON):** Head of E.ON innovation Center Energy Intelligence

**Suzanne von Kooten (TNO):** Director of Innovation Energy Efficiency

**Karen Henwood (University of Cardiff):** Senior Lecturer in Social Sciences,

**Prof. Lorenz Hilty (University of Zurich):** Professor of Informatics and Sustainability at the Department of Informatics

**Pieraldo Isolani (Unione Nazionale Consumatori):** President of this Italian consumer association

However, since the LOIs of the original S3C Advisory and Dissemination Board were collected in early 2012 and the 1<sup>st</sup> meeting was initiated and organized starting in early 2013, some minds and interests changed. A number of ADB members did not participate after all, instead new members were won for the project by several consortium members., which delayed the first meeting by several months.

The following ADB members, which sent Letters of Intent for the S3C-Proposal, are no longer available for the board or replaced by a new member:

Nicola Rega, Eurelectric AISBL	Has left Eurelectrics since signing the LOI and is not available anymore
Reinhard Brehmer, GEODE	No longer available for ADB
Hans Nilsson, Advisor to the Executive Committee of IEA DSM	No longer available for ADB
Amelia Buratti Simonetti, President in representation of the "Unione Nazionale Consumatori" (National Consumer Union)	Original Unione Nazionale Consumatori representative, replaced by Pieraldo Isolani
Dirk Van Evercooren, VREG, Director Markets	No longer available for ADB
Christian Fontain, CREG	No longer available for ADB
Damien Ernst, Associate Professor at the University of Liège	No longer available for ADB
Manfred Tautscher, Executive Director of SINUS Institute	No longer available for ADB
Ulrike Linnig, CapGemini, Lead of Smart City Services	No longer available for ADB
Paola Petroni, Enel, Project coordinator of Advanced	Replaced by new project coordinator Marina Lombardi

## 2. Status of the project

The meeting was opened by the project leader Dr. Erik Laes from VITO with a few words on the status of the project, the project partners and the organisational framework.

## 3. Vision of the S3C project

The S3C project manager Ludwig Karg gave a short presentation on the overall goal and vision of the project. The S3C project envisions a future energy system that will be..

- ..providing a vast variety of new energy related services on existing and new market places
- ..center around end-users and address them as consumers, customers and good citizens as well
- ..follow approaches from social sciences and behavioural psychology and include experience and know-how from other business areas (e.g. Marketing, telecommunication)

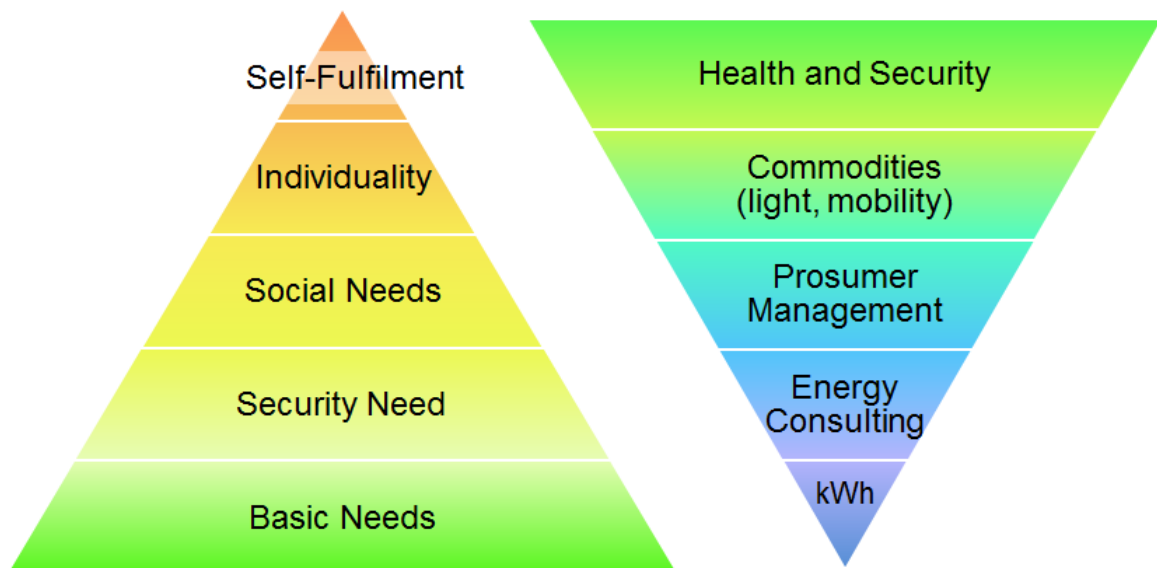
Presently, a metaphorical wall between the demand- and supply-side within the energy system prevents the formation of an interactive smart energy network promoting the role of the end-user not just as a user of energy but as a producer as well. Most residential and commercial end-users remain comfort-oriented in their choice and means of energy supply, which is why this project tackles smart grid research and development on the human level and seeks to identify behaviour-adjusting tools and not entirely technological tools. The project name S3C reflects three different roles for the end-user of energy in the future and in fact three different aspects on how to address people regarding smart grid issues:

- **Smart consumers** want to reduce energy consumption and costs and change lifestyle routines.
- **Smart customers** want to become a market partner by providing consumption or generation flexibility or energy services and/or receiving additional energy value-added services
- **Smart citizens** want to become part of a ‘smart energy community’ and help ensure the quality of supply and environment preservation as well as other value driven goals

Different projects and gadgets developed to attract people to smart grids were presented, including diverse apps for optimizing one’s energy consumption, rewards for energy-conscious communities addressing the citizen role in particular or artistically appealing hydropower plants developed to compliment land-and cityscapes. However, implementing one of these best practice tools does not suffice. The keys remain in an overarching customer engagement strategy and a multichannel communication



with end-users. A more visual explanation can be offered by classifying energy related services according to an inverted Maslow's pyramid:



**Figure 1: Comparison of the people oriented energy related services with the Maslow's hierarchy of needs**

The S3C project does not focus on the level of basic needs (which is the level energy consumption is set at for most end-users today). Instead, it seeks to lift energy consumption and production to the levels of social needs to self-fulfilment to thoroughly engage the now passive end-user and render energy a visible good again.

## Chapter B: Smart Energy Projects

### 1. Status of ADVANCED

Marina Lombardi was present at the ABD meeting to offer a status report for the ADVANCED (Active Demand Value and Consumers Experience Discovery) project, which is considered the sister project of S3C. The fellow EC FP7 research project is running until December 2014 and has the goal to empower smart consumers to participate in active demand (AD) and electricity supply system efficiency. The ADVANCED database is mainly built on the experience of their four pilot regions and the VaasaETT database containing data of 100 AD pilots. One of the first results of ADVANCED is a conceptual model that was translated into variables. Those variables are believed to influence the participation of consumers in AD initiatives and can be collected at the research site of Smart Grid projects or through surveys. The set of variables is defined in four main categories: generic, pilot, personal and other variables.

Furthermore, the following key performance indicator categories were identified for ADVANCED:

- Reducing system costs
- Maintaining electricity system reliability
- Optimisation of assets utilisation
- Improving energy sustainability
- Improving energy affordability
- Improving customer relationship

Additionally, the project analysed the risks of AD programmes and the stakeholders' perception thereof. With this, the basis for the analysis has been set and the project is now at the stage of data collection.

Comparing the ADVANCED project with S3C, it concentrates more on quantitative research, while the focus of S3C is on a qualitative approach. However, it was decided that both projects would benefit from a strong collaboration, especially in the investigative stage. Therefore, it was concluded to organise a workshop between January and April 2014 to discuss the interim results of both S3C and ADVANCED.

## 2. Family of Projects

S3C is an interactive project that welcomes other projects that are eager to expand their research to develop successful end-user engagement strategies. The three-step selection process and goals of this developing “Family of Projects” are defined in Work Package (WP) 2 and were described in Deliverable (D) 2.1.

Projects – self- or government funded, classic Smart Grid focus to regional energy value chain focus - are able to participate in the S3C-project as either active or passive pilots. Passive pilots offer the results and data of their project, which are used for the analysis of the user oriented interaction schemes of WP 3. Passive pilots may include ongoing and past projects. Active pilots are ongoing projects of which the time schedule overlaps with the time schedule of WP 5. Apart from sharing their data and results with S3C, these projects are willing to adapt their own implementation to include proposed S3C tools and recommendations.

As the leader of WP 2, Simone Maggiore (RSE) introduced a list of both possible active and possible passive pilots.

**Table 2: List of possible passive pilots**

Project	Consumers	Costumers	Citizens
3e Houses	x	x	
AlpEnergy	x	x	
AMI by Elektro Grenjska	X		
Ashton Hayes Smart Village	x	x	x
Cloud Power Texel		x	x
Consumer reactions to peak prices	x		
Costumer Led Network Revolution		x	
co2online	x	x	
E3soho	x	x	
Eoffices		x	
EcoGrid	x		
E-DeMa	x	x	x
EDRP – Energy Demand Research Project	x	x	X
eFLex	x		
E-mobility	x		
Energy Sustainable Island for Real Life Community		x	x
“Energy Village” Wilpoldsried	x	x	x
ESB Smart metering Customer Behavior and Technology Trial	x		
eTelligence	x	x	
EU-DEEP		x	
EVANDER		x	x
FlexPower	x		

Green eMotion		X	X
GREENLYS	X	X	X
Grid4EU	X	X	
GridTeams	X	X	
GridWise (Part 1)		X	
GridWise (Part 2)	X		
REloadIT	X	X	

**Table 3: list of possible active pilots**

Project	Consumers	Customers	Citizens
BeAware	X		
BIDELEK - BIZKAYA	X	X	X
Bristol Smart City (B.R.I.S.T.O.L.)	X	X	X
COTEVOS	X		
eBadge		X	
Energy @ home	X	X	
Hus 14: energy visualization in offices	X		X
InovCity	X		
KIBERnet	X	X	
Linear		X	
MobInCity		X	X
Network design and management in a Smart City with large development of DER	X		
Price	X		
Promoting energy efficiency in households using smart technology	X		
Salzburg Model Region (HiT)	X	X	X
Tweewaters		X	

The members of the ADB advised the consortium to include more self-funded projects (e.g. Energy@home) in the “Family of Projects” to better evaluate long-term effects of projects, especially after EU-funding stops.

The following other projects were suggested as possible active partners:

- Linz AG
- Stockholm royal seaport
- Birmingham

Also, ADB-members Michael Hübner and Wolfgang Teubner agreed to provide the consortium with additional possible projects that appear to interesting to analyse.

## Chapter C: Workshops

### 1. Do's, Don'ts and Don't Knows of end-user involvement

Apart from acting as project coordinators, VITO is also tasked with the leadership of WP 1, which deals with the framing of S3C. In this context, they held a workshop on the Do's, Don'ts and Don't Knows of end-user involvement to profit from the input of the ADB members. The challenge of end-user involvement is being handled from two perspectives: The theoretical and empirical perspective and the end-user and design perspective:

- Theoretical & empirical perspective
  - Social-psychology, economics, sociology, innovation, communication, (social) marketing
  - Evaluation reports and meta-reviews of experiences with smart grid projects
- End-user & empirical perspective
  - End-user perceptions, drivers, barriers
  - End-user interaction schemes

Through this approach, VITO isolated a number of drivers and barriers that affect end-user behaviour:

**Table 4: Results of end-user perspective: drivers & barriers**

Drivers	Barriers
Financial incentives	Increased costs
In-kind incentives	Privacy and security concerns
Value added service	Loss of comfort
Improved reliability	Free rider effects
Environmental benefits	Loss of control over appliances
Better insight in energy use	Clarity of provided information
More transparent and frequent billing	Inability to deal with new technology
Possibilities to participate in the energy market	Changing routine behaviour
Feelings of independence	Awareness lag
Community feelings	Lack of knowledge about potential benefits
	'Myths' or 'misconceptions'

ADB members emphasised putting a strong focus in end-user involvement on goal-definition. Barriers and drivers can differ according to context and life-style. This implies that the distinction between drivers and barriers is problematic; one should rather focus on energy related practises. Instead of concentrating on financial incentives, consumers need to be educated on why they have to change their behaviour in order to increase their willingness-to-pay, engage them on a long-term basis and avoid a rebound-effect. Consumers must be offered a transparent cost-benefit analysis, including information on installation costs and amortisation time-span.

Additionally, the ADB members advised the consortium to include the drivers fun and social norms into the working process. Playfulness and joy could compensate for lacking financial incentives. Experience from the project InovGrid showed that their 'principle of humanisation' managed to increase the acceptability of new technologies among their pilot consumers. The 'principle of humanisation' was executed as a multichannel, 24 hours open communication with consumers based on an online platform.

Following this discussion, members of the ADB were asked to provide the consortium with their specific opinion on what to do and what not to do when involving end-consumers. Also, they were asked what

they ‘didn’t know’ or saw as unsure aspects in end-user involvement. Figure 2 and Figure 3 provide a first clustering of the do’s and don’t’s mentioned, using the key success factors described in the synthesis document as categories<sup>1</sup>. Figure 4 defines a number of topical clusters to categorize the don’t knows. The bullets in figures give examples of issues mentioned. The font size of the headings indicates the number of issues mentioned under that category. These results will be used to improve the description of success factors and key challenges in the final version of deliverable 1.1.

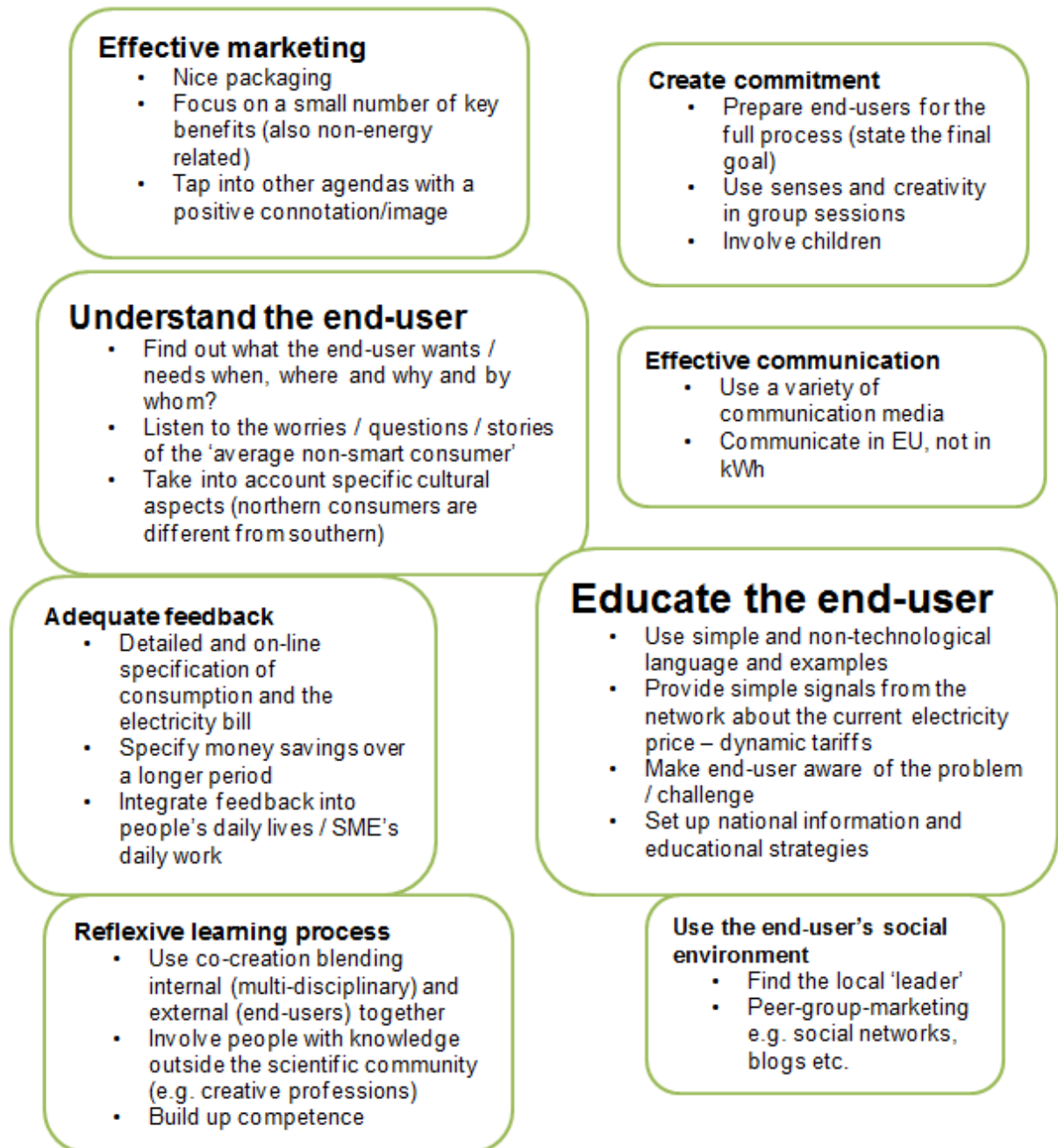


Figure 2: Do's in end-user involvement

<sup>1</sup> The one size-fits-all category was added as a cluster of don't's

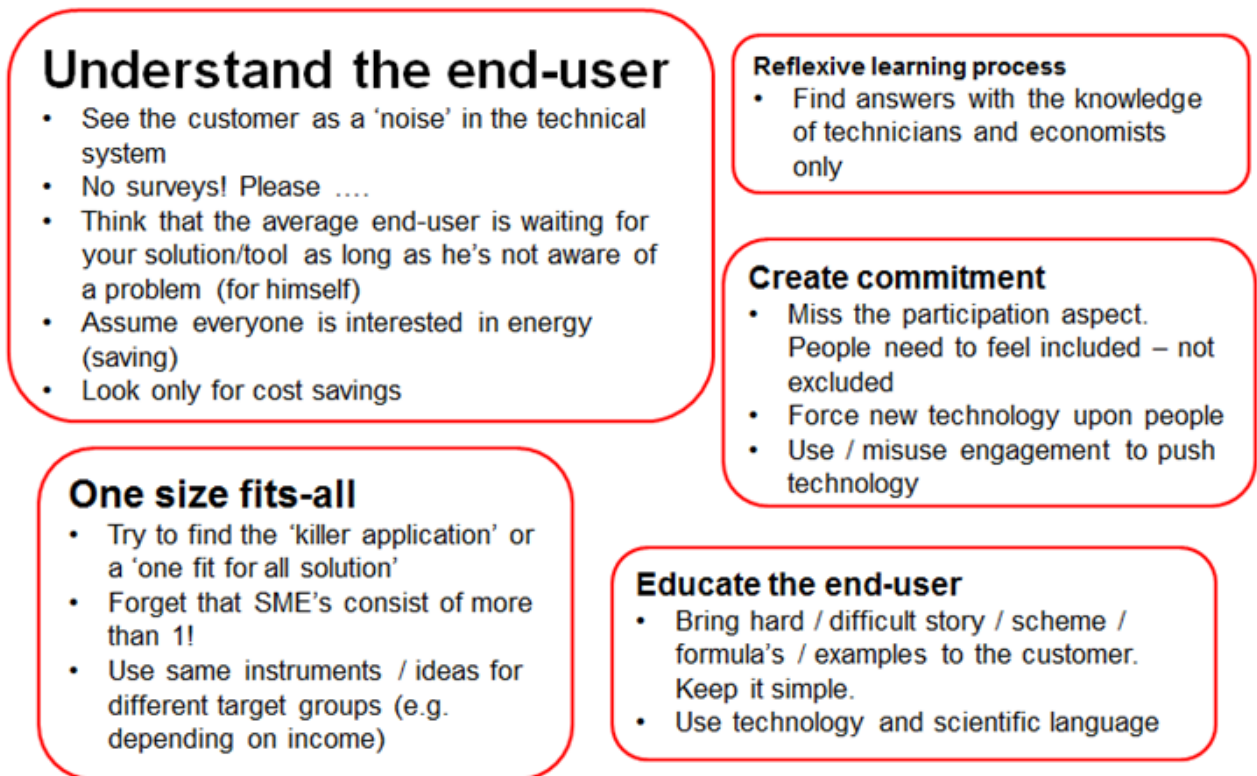


Figure 3: Don'ts in end-user involvement

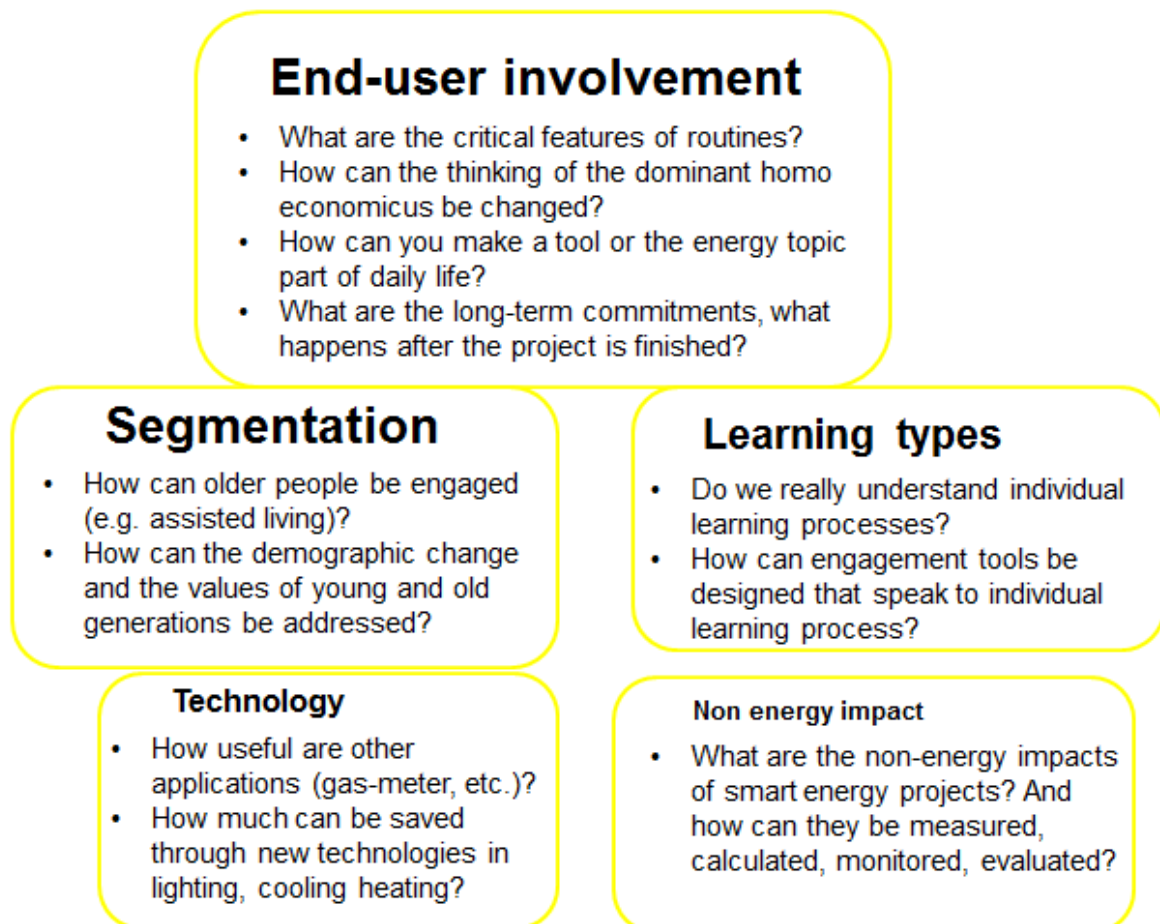


Figure 4: Don't Knows in end-user involvement



## 2. S3C Tool Development

The project partner ECN was assigned with the development of an adequate toolkit. The objectives of the toolkit were explained to the ADB members as follows:

- ‘what works’ will be translated to ‘how this can be achieved’
- Success factors and promising practises will be translated into guidelines and tools
- Guidelines and tools will be tested in active pilots and continually improved
- Reiterative process will result in a validated actionable toolkit customised for practitioner’s needs

For clarification purposes ECN provided the ADB members and the consortium with fixed definitions of the most important terms.

**Tools:** Instruments or processes that aim to facilitate the interaction of end-users with the project partners, the electricity grid and the energy market. Tools can be technical, financial and oriented towards communication and engagement.

**Guidelines:** Step-by-step descriptions of a process to implement a tool (including do’s and don’ts and practical examples)

**End-user interaction scheme:** Collection of tools (and methods) adopted to facilitate the interaction of end-users with the project partners, the electricity grid and the energy market. The finished toolkit is supposed to address primarily energy companies and should not provide specific information for potential other target groups such as policy makers, consultants and researchers as well as prosumers. The ADB members saw the central problem in designing a toolkit website in addressing different target groups at once. From the discussion with the ADB it became clear that it should not be possible to focus the information on the website for all potential target groups, seeing that their interests might be too diverse.

ECN plans to develop an interactive toolkit website as a ‘toolbox’ with the key requirements that it should be user friendly, intuitive (max. 4 clicks to reach a tool) and offering printable tool descriptions as well as an intelligent search function. As a possible role model for such an interactive website, the MECHANisms website (Make Energy Change Happen Toolkit; [mechanisms.energychange.info](http://mechanisms.energychange.info)) was presented. A first outline of the toolkit website plans to structure it so that the tools can be accessed through three gateways: the project phase, themes and project objective.

Another strongly debated topic was, whether the input on the website should fed in once and remain static or should be updated regularly. In this context, Ruth Mourik, who took part in developing the MECHANisms website, warned the consortium that people were losing interest in the website as the content became continuously more irrelevant and outdated. Several ADB members suggested integrating a user platform or forum for information exchange into the website. The idea is to create ‘self-sustained content updates’ by providing tools and ideas about which users can write little narratives on their experiences and further ideas on best practise. The proposal of offering a tool-wiki, however, was rejected on the grounds that it would be too cost and time-intensive, especially after the eligibility period.

Apart from these main issues, the discussion revolved around several smaller points. The dissemination of the website must be far-reaching and diverse. Many utilities and other energy related companies most often do not even consider using external websites. Furthermore, the toolbox cannot dictate a certain process but needs to be embedded in the innovation process of companies following the process flows of the companies it addresses. In this context, the consortium should make an effort to get access to these web-tools. Another important yet difficult issue persists in raising awareness for behavioural aspects in project managers and utility decision makers. How can S3C influence a utility to ask the right questions about end-user activation and engagement? It is crucial to transmit the idea that they are deploying Smart Grid technology as a means to an end and not as the end as such. The end-users have to play a role in the project planning starting in the very beginning and cannot be considered a more or less important intervening variable in the technical set-up of a smart Grid project.

The website should also include an introduction to clarify the tools and possible tool combinations in order to be of interest to utility representatives. The ADB members also advised the consortium to include a list of most common mistakes and bad examples from projects in the past on the website.

Finally, the consortium was advised to not create ‘just’ another information library, but to stay new and innovative. All in all, dissemination should not solely focus on using the website, but include other channels and direct human contact.

### 3. Untested end-user engagement strategies and tools

Finally, the consortium members of SP, Magnus Brolin and Maria Thomtén organised a workshop in which they asked members of the ADB and consortium to collect thoughts and ideas concerning current trends and future developments of end-user interaction schemes. The topic was discussed in three working groups using the following matrix:

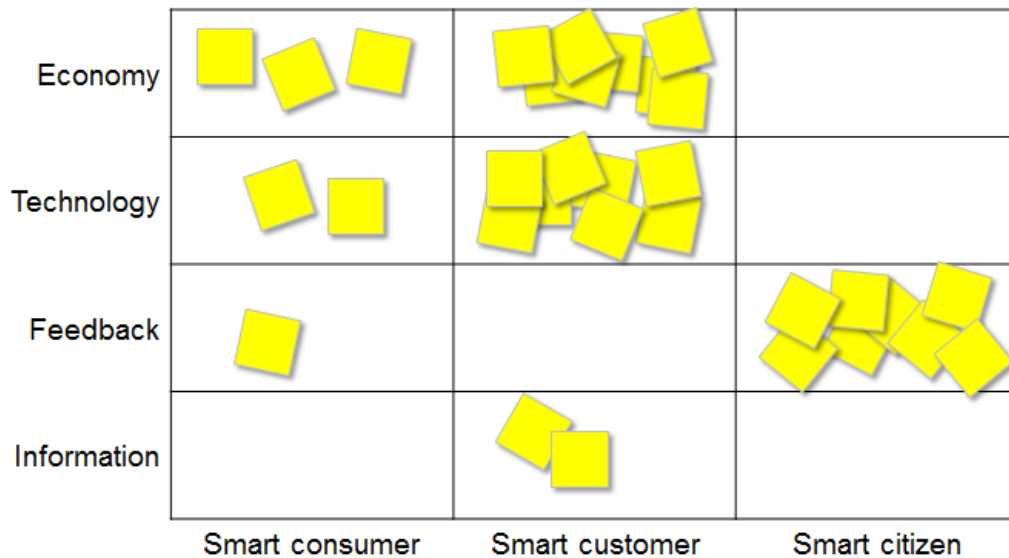


Figure 5: Matrix for the workshop on untested end-user engagement strategies and tools

#### Participants of group 1

**Moderator:** Magnus Brolin

**ADB members:** Prof. Américo Mateus, Wolfgang Teubner, Dr. Tiit Kallaste, Marina Lombardi

The discussion in working group 1 revolved strongly around the smart citizen. Current schemes and trends try to engage neighbourhoods or social areas in energy projects. EDP installed “blueboards for visualising energy” in one of their pilot cities, where neighbourhoods and single citizens were ranked according to their energy consumption. A similar idea has been implemented by the Design Lab at the University of Sydney in collaboration with the K.U. Leuven. The ‘Neighbourhood Scoreboards’ displayed energy consumption publicly and visually attractive.





**Figure 6: Neighbourhood Scoreboards in Sydney (Source: neighbourhoodscoreboards.com)**

Another example that caters to the smart citizen is engaging senior citizens and pensioners in projects to save energy, which was done in the EverGreen project by the GlobalActionPlan (UK). The GlobalActionPlan website ([www.globalactionplan.com](http://www.globalactionplan.com)) was suggested to generally be a good place to learn about best practise examples of community approaches for behavioural change. Further initiatives that involve parents and children have been tested, e.g. in Portugal, citizens changed the lighting of a local school to LED-technology together.

Opower, a company that deals in customer engagement for the utility industry, tried to build a bridge between the smart customer and the smart citizen. Citizens were motivated to save energy by receiving transparent data about their energy consumption and a comparison with houses in their direct neighbourhood.

Customer empowerment was also discussed as a valid strategy. Providers need to establish a relationship with their customers by offering platforms, where customers can rank providers and express their wishes. Stakeholder processes should be driven more by the end-user side (e.g. Participative energy governance in Denmark).

Members of the ADB and the consortium emphasized the need for a humanisation of provider companies. The providers should create structures with local representatives that function as activators inside their communities, e.g. through gamification (gadgets and games kids, etc.).

In conclusion, current trends largely revolve around feedback, technology and information. Social networks and gaming are new feedback options that are implemented now and also show some potential for future projects.

As a visionary future trend in end-user involvement a ‘House developer’, a technical gadget that should offer advice about the planning of houses, on consumption and on amortisation periods for new technologies, was mentioned.

A second house gadget that monitors production and consumption was suggested by a Wolfgang Teubner to increase the awareness of how much energy is consumed. Such a gadget should be integrated in each new building to visualise the potential benefits of acquiring energy from regenerative sources.

Also, smart citizens need to be included in the urban planning process. The ‘Smart City Roadmap group’ should make use of the cities’ ability to mobilise their customers.

Lastly, utilities should offer their customers increased transparency to make them feel in control of their energy consumption.

## Participants of group 2

**Moderator:** Dr. Erik Laes

**ADB members:** Mohamed al Marchohi, Michael Hübner, Gernot Hagemann, Heidi Laenarts, Igor Papic, Rout Mourik

The members of the ADB and consortium opened the discussion by giving several examples for current trends and schemes in the feedback category, including smart billing, ranking a community's success in implementing regenerative energies (e.g. in the project MeRegio), the 2020 vision from Switzerland and Warm Up New Zealand: Heat Smart (health impact of energy consumption).

Current trends of end-user engagement in commercial end-user sites include especially playful gaming approaches. In projects as e.g. Ecooffices employees e.g. receive a fictional currency and prices for energy saving. Current schemes focus on designing information that is attractive to the specific target groups and offers practical tips instead of theory alone. The following discussion stressed that with implementing smart grid technologies people will have to become more flexible in their energy use. A change of value has to happen in order for invest in smart homes.

Opinions on what the electricity system will look like in 20 years differed strongly between the group members. Some proposed an 'energy flat rate' as a future development. A fixed monthly rate for electricity is offered in exchange for the flexibility of the end-user regarding their household applications and potentially also DER units. The applications or generation units are controlled by an energy management system that is set by the end-users. Utilities, aggregators or DSO's can control the load and generation within the boundaries set in the energy management system. Customers would benefit from such a 'flat rate', because of the price stability it ensures while grid operators will be able to counter grid bottlenecks and neutralise potential excess generation. Utilities will be able to optimise their purchases at the EEX and other markets.

ADB member Ruth Mourik suggested an overall reconsideration of values in the future through a societal change that will translate into a change in technology. However, people will remain suspicious of changes that originate in the technology sector.

In another scenario, discussed by the group, the cost for energy generation decreased, but electricity cost would remain constant as the returns would be invested into grid reinforcement.

One major challenge will remain to develop end-user involvement strategies that are applicable for citizens and customers. Whereas some end-users will strive for independent supply and will be easily motivated to change their behaviour to realise decentralised regional solutions (identification with 'your' grid), others will put personal benefits and financial gains first and not seek to take part in the change at all. This, however, is strongly context-driven. Looking at the example of the Italian smart meter rollout, it might not have served its purpose in terms of customer involvement, but it did result in decreasing electricity theft. A smart grid for all people will have to accommodate for both perspectives, the citizen and the customer perspective.

Lastly, there was a strong consensus in the group that offering feasible solutions for energy storage will become essential for the advancement of smart homes.

## Participants of group 3

**Moderator:** Dr. Pieter Valkering

**ADB members:** Julia Seixas, Paolo Landi, Dr. Carlos Rosa, Prof. Cecilia Katzeff

Results of the discussion in the third group partly overlapped with the results of the other discussion groups. Smart and transparent billing, social networks, gadgets for children to control energy and graphical presentation of consumption (e.g. as part of a weather station) were also identified as current end-user involvement schemes. Additionally mentioned was a so-called 'Holliday button' to minimise consumption during long-term absences and prepaid energy taxes, which offer a discount in exchange for buying a certain amount of energy in advance. Exceeding the amount or deviating from it would then result in a penalty payment. This group proposed that it might be beneficial to combine ambient tools (short-term response) with tools that have a long-term response (e.g. billing). Paolo Landi shed light on the Smart Meter rollout that already took place in Italy and considered its effects in terms of customer engagement as unsuccessful. However, he attributed this failure to the fact that the smart meters were not accompanied by smart applications.

In terms of energy production, the group members arrived at the conclusion that a stronger focus should be put on people identifying themselves with the product, on being proud of 'their' energy.

The idea of the group for future schemes of end-user involvement concentrated on creating awareness in the end-user of the difference between 'saving energy' and 'shifting energy'. Again, this group suggested that small local production units that allow independence from big companies and external suppliers could be a feasible future business model. With proper adaptation of the legislation such small community production units might also offer system services to the grid operators.

The members of this group isolated the following discussion highlights:

- "Services for the System operators"  
The main issue of the demand response should be offering the system services to DSOs and TSOs to stabilise the grid and reduce investments.
- "What is a kWh"  
Generating interest and supporting acceptability in the end-user has to start with a proper explanation of what the saving amount is.
- "The household is not an economic player"  
Thoughts about the economy are not a priority in most households.
- "People like to make it fun"  
Gaming, social networks and competitions, etc. are very important drivers for the involvement of end-users
- "Define exact goals"  
Tools and guidelines should be clear and defined.
- "Feedback is necessary"  
The success and continuation of the project is dependent on viable feedback loops and open dialogue.
- "Innovative presentation and design of Energy usage"  
Present electricity bills and home units displaying histograms are not popular.
- "Funding scheme for the Family of Projects"  
Analysing the active and passive projects from the FoP, another important issue is the segmentation of projects based on the (co)funding scheme.
- "How can the web-tool be successfully disseminated?"  
Dissemination of the S3C toolkit needs to be broad and multichannel.

## Chapter D: Outlook

After a recapitulation of the day's discussions, the members of the ADB were asked to choose whether they would prefer the next meeting before or after the implementation of the tools has been started. The next ADB meeting is set to take place in April or May 2014, before the start of implementation within the active partner projects of S3C.