S3C

SMART CONSUMER
SMART CUSTOMER
SMART CITIZEN

MIDTERM CONFERENCE

EVORA, 27 MAY 2014

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S3C core idea

Support the energy utility of the future to effectively cooperate with

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Support the energy utility of the future to effectively cooperate with

- ***SC1 - smart consumers***, who want to
  - reduce energy consumption and costs
  - change lifestyle routines to a limited extent
- ***SC2 - smart customers***, who want to get services to become
  - a prosumer, i. e. produce as well as consume energy or provide energy services
  - a market partner with providing consumption flexibility or energy services
- ***SC3 - smart citizens***, who want to
  - become part of a ‘smart energy community’
  - help ensure quality of supply and environment preservation

Central research question

'How can active (or 'smart') energy-related behaviour be fostered by active end user engagement strategies in smart grid projects?'

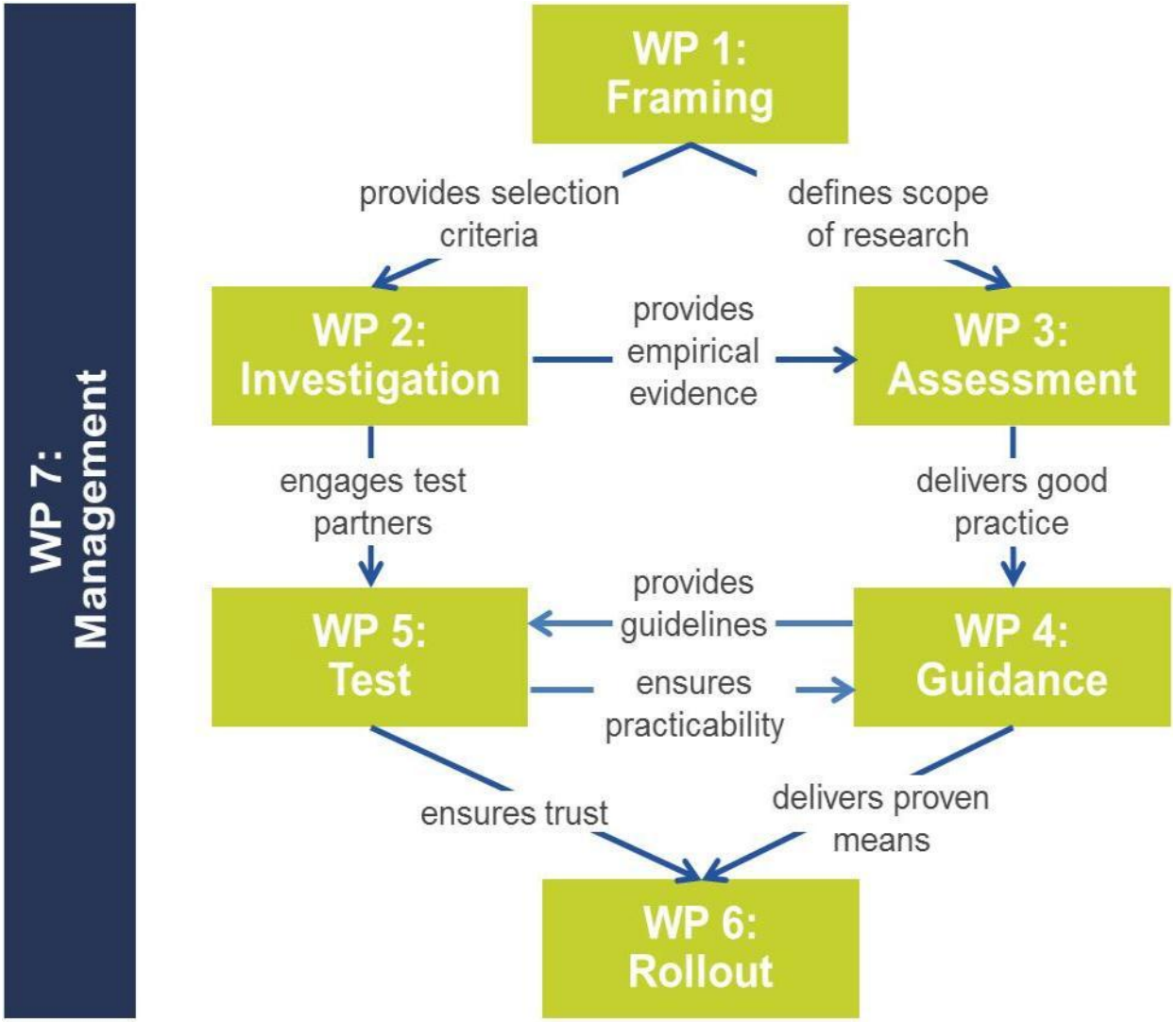
Basic information

- S3C – “Smart consumer, smart customer, smart citizen”
- FP7 – Energy.2012.7.1.3 “Empowering smart customers to participate in active demand and energy system efficiency”
- Duration: 1 November 2012 – 31 October 2015 (3 years)

http://www.s3c-project.eu/

- Partners:

Work packages

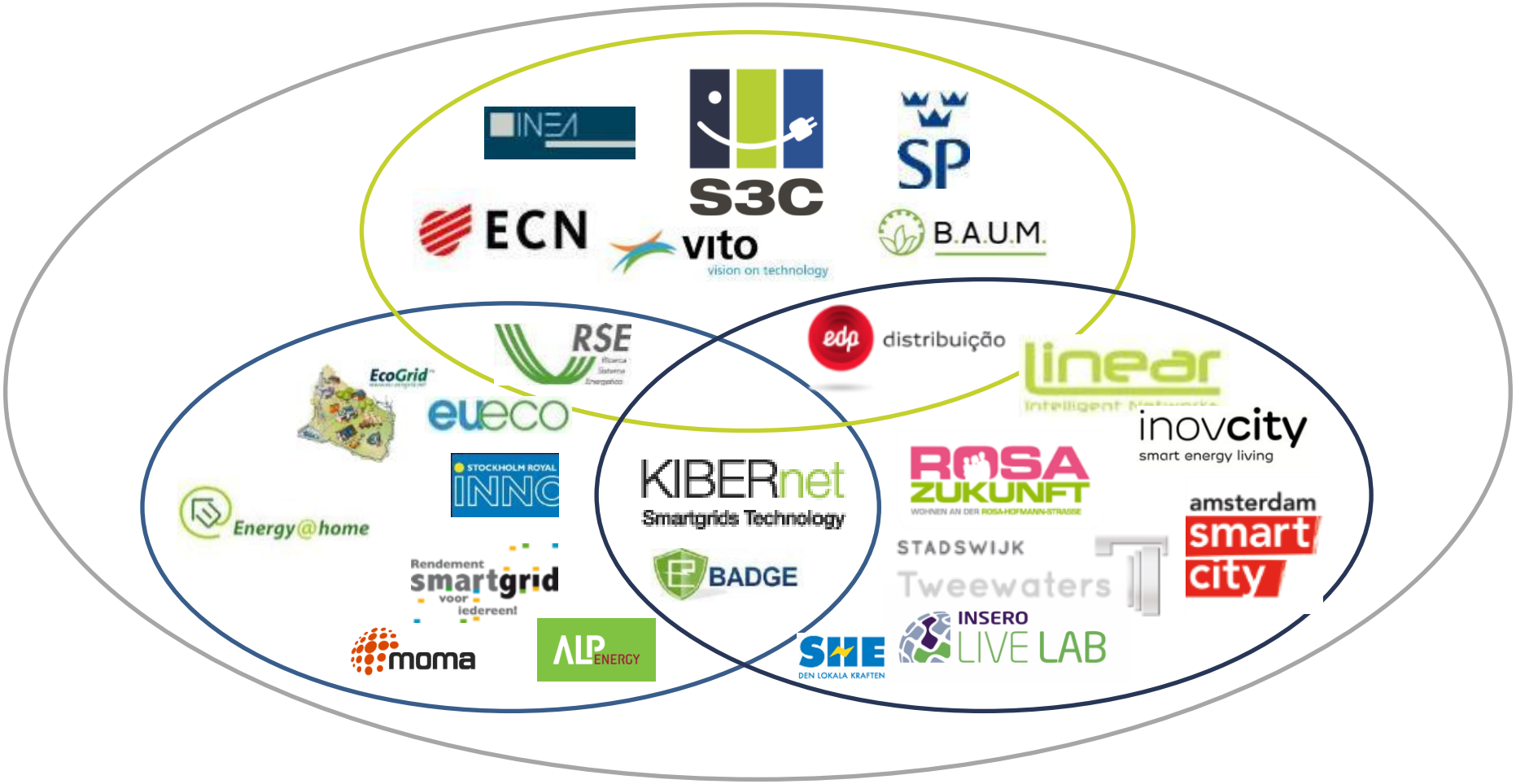


S3C output – Tools and Guidelines

- **Guidelines** contain descriptive *information to explain* a particular topic and to address issues or questions that should be taken into account. In addition, a guideline makes clear and how it relates to other topics in the toolkit.

- **Tools** are ready-to-use instruments, processes or step-by-step descriptions that aim to facilitate the interaction between end-users and the smart energy project (e.g. the project management, the electricity grid, and the energy market).

The S3C Family of Projects



4 out of 5 European projects on the shortlist for the ISGAN award are in S3C

International Smart Grid Action Network

EcoGrid: Consumer Engagement Østkraft Holding A/S (Denmark) – 2nd place

PowerMatching City, DNV GL (The Netherlands)

Inovgrid, EDP Distribuicao Energia S.A. (Portugal)

LINEAR - Local Intelligent Networks for Energy Active Regions, VITO (Belgium)

Borrego Springs Microgrid Demonstration, San Diego Gas and Electric (USA)

NICE Grid the French Demonstrator of GRID4EU, Electricité Réseau Distribution France (ERDF) (France)

Pacific Gas & Electric's Green Button, Pacific Gas and Electric (USA)

Share!, Kitakyushu Smart Community Council (Japan)

Advanced Building-Scale Smart Grid Demonstration at Mesa del Sol, SNL (USA)

Source: www.iea-isgan.org

Literature review State-of-the-Art

Guiding questions:

- ***What drives end-user behaviour?***
  - Enablers & barriers
- ***How to engage with end-users?***
  - Success factors / do's and dont's
- ***Where do we need to know more about?***
  - Challenges / don't knows

Approach

Theory

- Social-psychology, economics, sociology, practice theory, innovation
- Segmentation
- Communication & (social) marketing

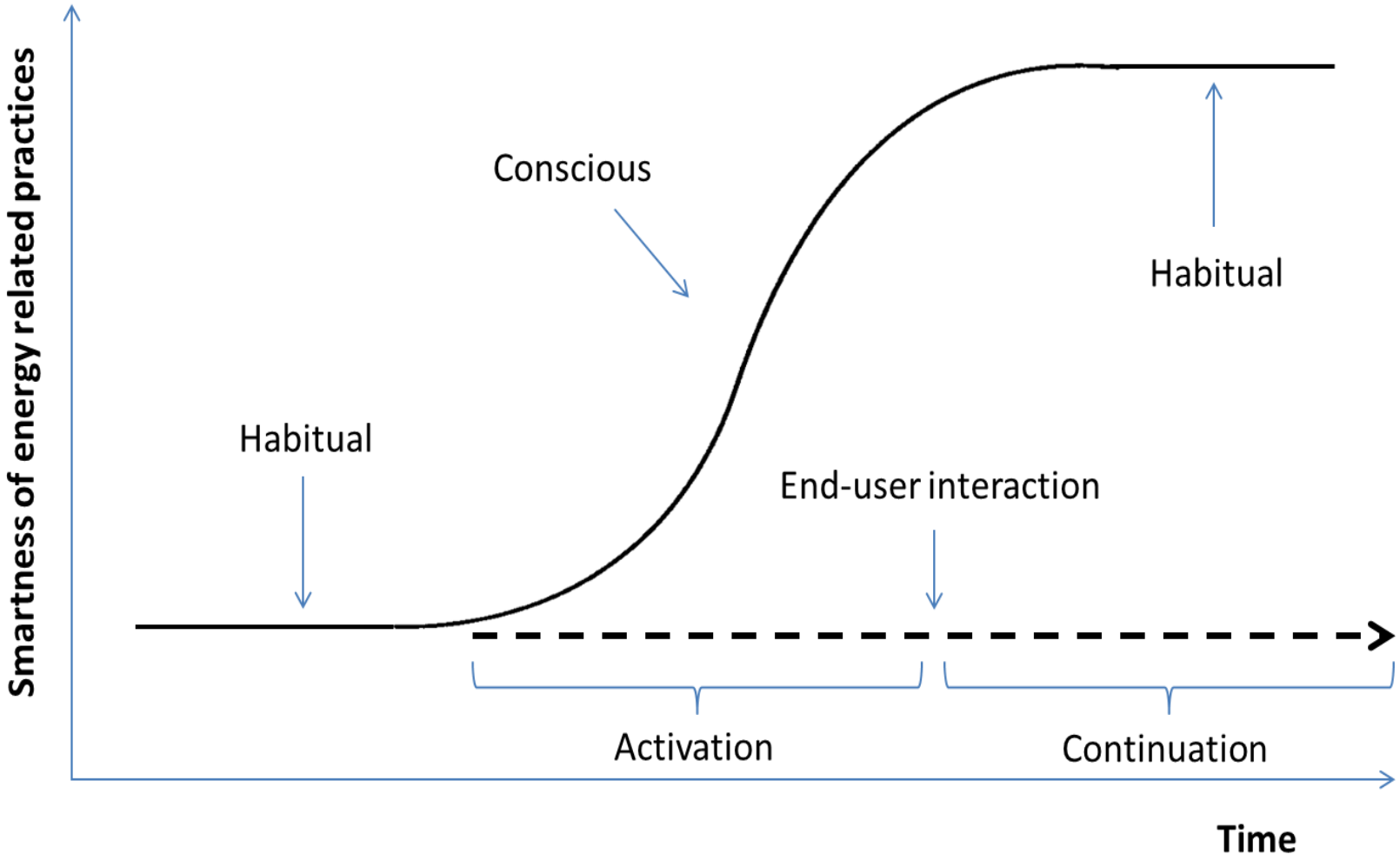
Empirical research

- Feedback, pricing, communication
- Privacy & security
- New market structures & aggregation
- Experiences from mobile phone / ICT

Synthesis

- Enablers and barriers
- Success factors
- Challenges for further research

Framing the process



Enablers & Barriers

Category	Enablers	Barriers
Comfort	• Comfort (gain)	• Comfort (loss)
Control	• Additional control options	• Loss of control over appliances
Environment	• Environmental benefits	
Finances	• Financial incentives • Lower energy bill	• Investment costs • Increased energy bill
Knowledge & Information	• Transparent and frequent billing • Insight in electricity use	• Information provision • Competences • Awareness
Security	• Reliability	• Privacy and security
Social process	• Role models • Customer testimonials • Competition • Fun • Community feelings	• Free rider effects • Job losses

9 challenges for 'transitioning' smart grid projects

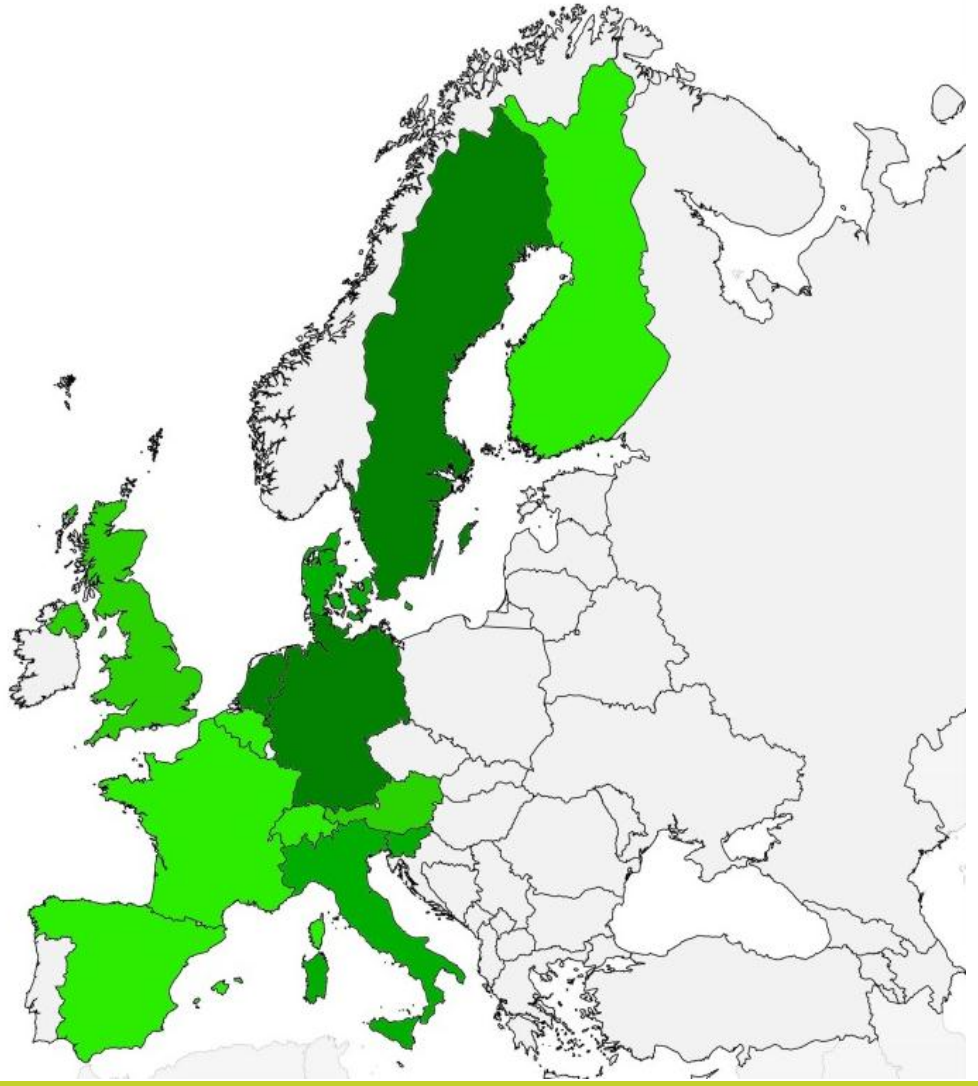
1. Which instruments or approaches contribute to achieving better understanding of the ***needs and desires of target groups***?
2. What innovative ***products and services*** contribute to fostering smart energy behaviour?
3. Which ***incentives and pricing schemes*** contribute to fostering smart energy behaviour?
4. What ***feedback information and which feedback channels*** contribute to fostering smart energy behaviour?
5. Which ***communication channels, information and marketing techniques*** contribute to recruitment and engagement of end users in smart energy projects?
6. Does ***involvement of non-energy stakeholders*** contribute to end user engagement and smart energy behaviour?
7. Which instruments or approaches contribute to the development and support of ***smart energy communities***?
8. Which features of the interaction between end-users and ***energy market structures*** contribute to end user engagement and smart energy behaviour?
9. Which issues hamper / facilitate ***up scaling or replication*** of smart energy projects?

S3C Family of Projects: 32 case studies

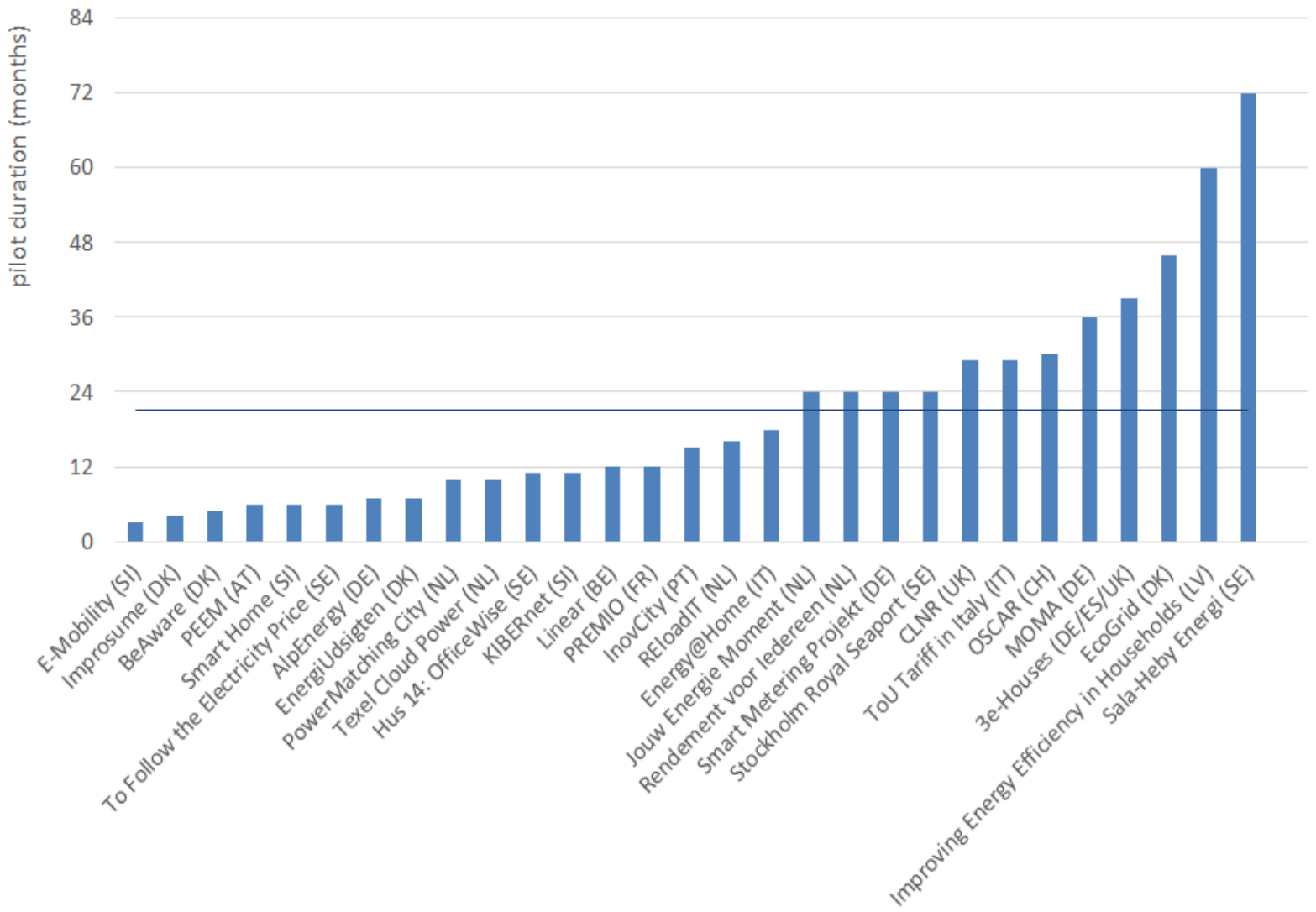
- FoP consists of **'smart energy projects'**:
  - *Smart grid projects* implementing smart grid infrastructure
  - *Smart energy behaviour projects* that focus on engaging end users without implementing smart grid technology
- Projects in the FoP display a **potential for learning** with respect to end user interaction (S3C selection criteria)
- **Qualitative case study data** extracted from:
  - Project documentation (desk research)
  - Face-to-face interviews with project managers/representatives
  - (and in some cases interviews with end users or other stakeholders)
- **Cross-case analysis**: best practices, cross-cutting succes factors & pitfalls

32 smart energy projects in 15 EU countries

ID	Country	Frequency
1	Sweden	6
2	Germany	5
3	The Netherlands	5
4	Denmark	3
5	Italy	3
6	Slovenia	3
7	Austria	2
8	UK	2
9	Belgium	1
10	France	1
11	Finland	1
12	Latvia	1
13	Portugal	1
14	Spain	1
15	Switzerland	1

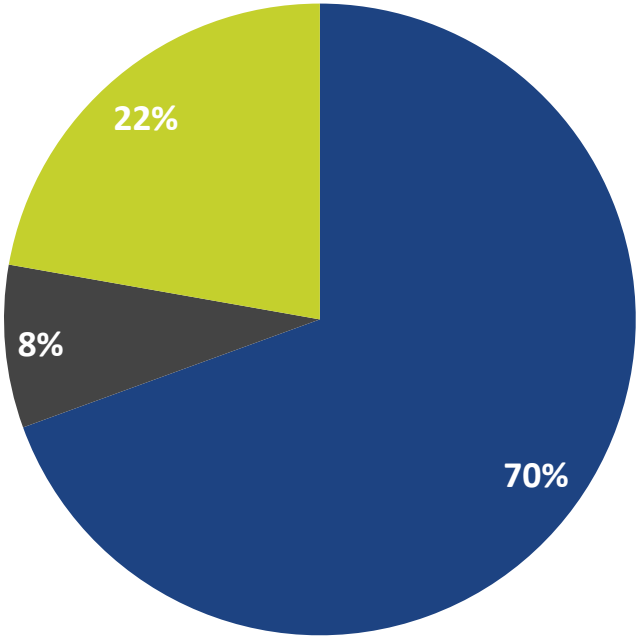


…ranging from 3 months to 6 years

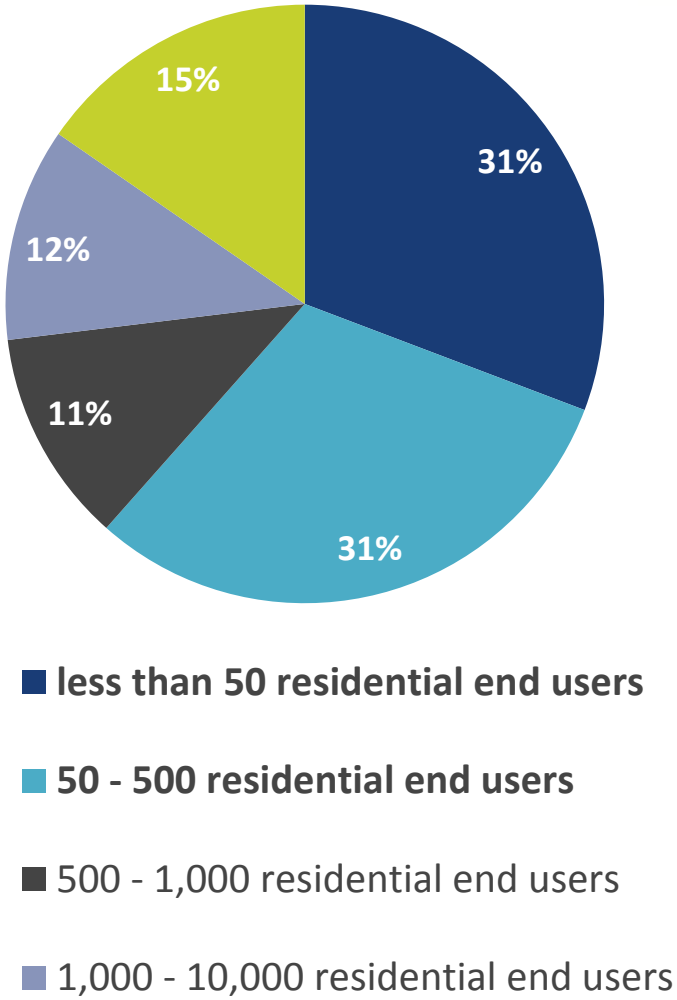


…involving residential end users and SMEs

Types of Users Involved

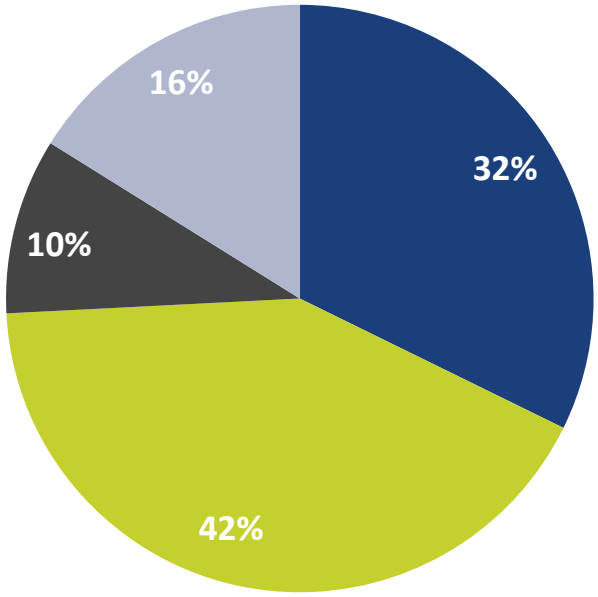


Number of Users Involved



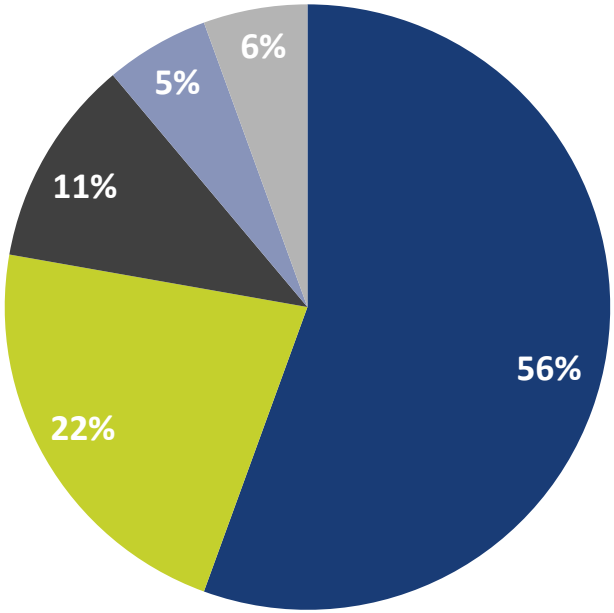
Project features

Type of Tariff Implementation



- Projects with full manual control
- **Projects with combined automated and manual control**
- Projects with automated control
- Smart energy behaviour projects

Types of Tariffs Applied



- **Time of Use (ToU)**
- Real Time Pricing (RTP)
- Consumption Based Pricing (CBP)
- Critical Peak Pricing (CPP)

Cross-cutting success factors

1. Address end users as human beings instead of as points of electricity demand
2. Obtain a thorough understanding of target groups
3. Emphasize sense of place: underscoring the local character of a smart energy project
4. Draw upon community dynamics
5. Test Before the Rollout
6. Give personal attention and build trust over time
7. Motivate end users with fun and good news

Cross-cutting Success Factor 1

- **Address End Users as Human Beings Instead of As Points of Electricity Demands!**

Enquire and respect **end-user preferences and routines** before designing your interaction schemes

Pinpoint the **everyday life** of your customers in **communication**, use focus groups to test products, brands etc.

Feedback Information should be transparent, understandable and accessible for your Customers – Rely on accepted technologies (smartphones)

Technology is a means to achieve an end and not the end itself. The Smart Grid can only be successful, when a market carried by the demand side develops.

Cross-cutting Success Factor 1

- Address End Users as Human Beings Instead of As Points of Electricity Demands!

Model region Salzburg – PEEM (AT)

Fore-watch in-house display designed as a kitchen clock to suit everyday social practices.

Cross-cutting Success Factor 1

- **Address End Users as Human Beings Instead of As Points of Electricity Demands!**

Sala-Heby Energi (SE)

Stepwise implementation of ToU-tariff: consulting local end users to tailor the tariff structure to their needs and adjusting terms and conditions along the way.

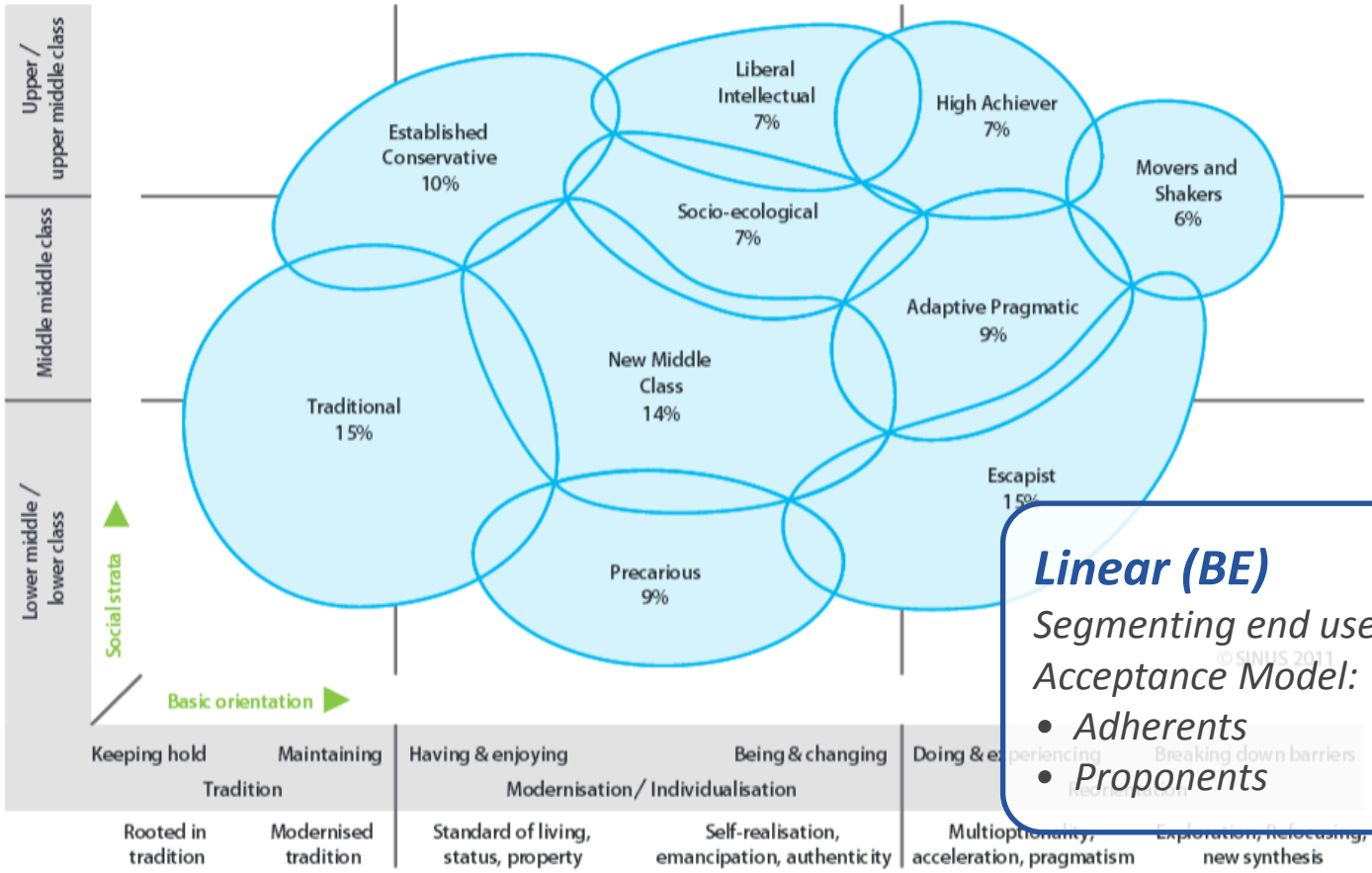
Cross-cutting Success Factor 2

Obtain a Thorough Understanding of Your Target Group!

- How do end users actually interact with new technologies, what are their attitudes and perceptions towards the project and the products and services introduced to them?
- The case studies reveal several innovative and effective methods to get an in-depth understanding of target groups, such as qualitative contextual inquiries, the use of culture probes, home visits, and co-creation and gamification-based workshops.

Cross-cutting Success Factor 2

Obtain a Thorough Understanding of Your Target Group!



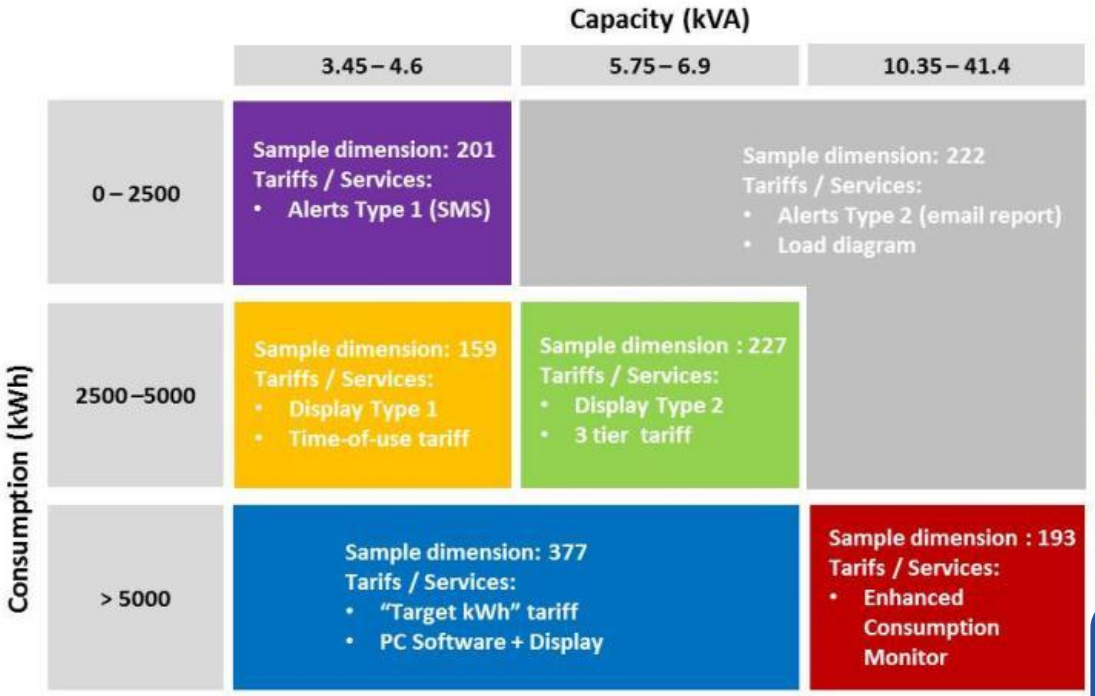
Linear (BE)

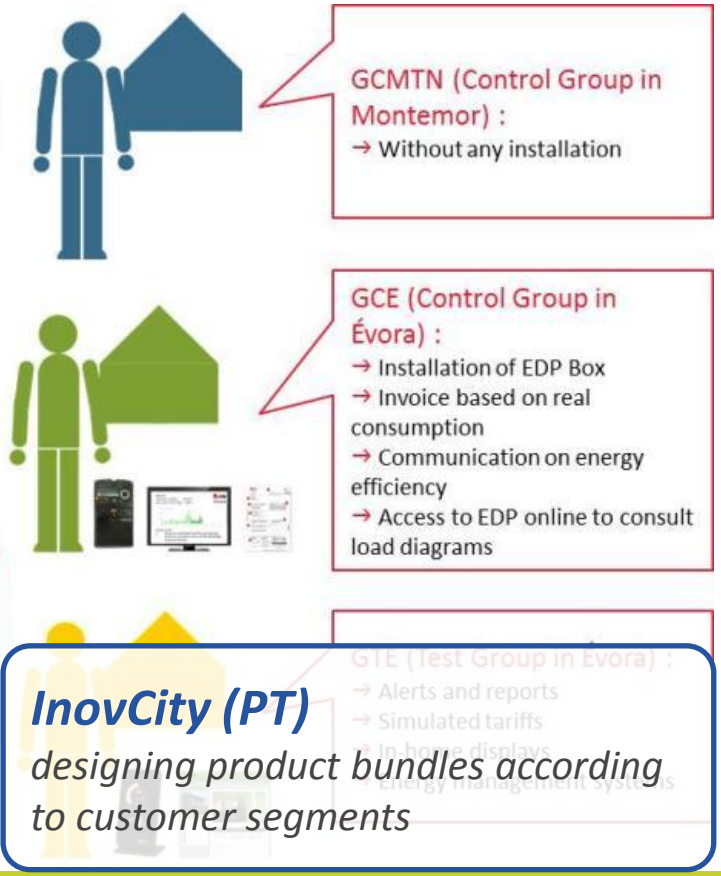
Segmenting end users based on Technology Acceptance Model:

- *Adherents*
- *Proponents*
- *Doubters*
- *Recusants*

Cross-cutting Success Factor 2

Obtain a Thorough Understanding of Your Target Group!





InovCity (PT)

designing product bundles according to customer segments

Cross-cutting Success Factor 2

Obtain a Thorough Understanding of Your Target Group!

Hus 14: OfficeWise (SE)

Co-Creation and Focus Groups in the Project Design Phase

Cross-cutting Success Factor 3

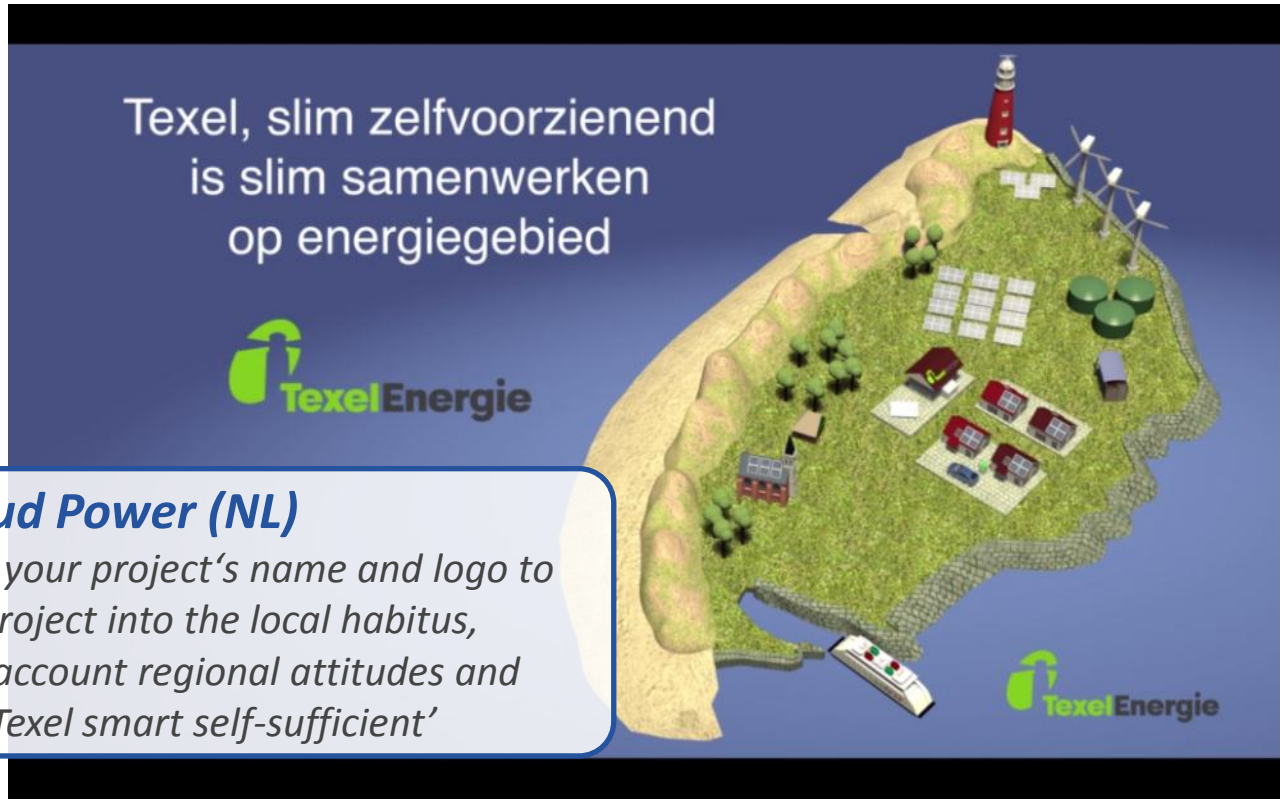
Emphasize a ‘sense of place’ by underscoring the local character of a smart energy project

EcoGrid (DK)

community event with a locally well known comedian and a band to inform participants and recruiting community members .

Cross-cutting Success Factor 3

Emphasize a ‘sense of place’ by underscoring the local character of a smart energy project



Texel Cloud Power (NL)

Regionalise your project‘s name and logo to frame the project into the local habitus, taking into account regional attitudes and identities: ‘Texel smart self-sufficient’

Cross-cutting Success Factor 3

Emphasize a ‘sense of place’ by underscoring the local character of a smart energy project

Sala-Heby Energi (SE)

Organize field trips and events at the utility, renewable energy plants etc.

Cross-cutting Success Factor 4

Draw Upon Community Dynamics!

Rendement voor Iedereen (NL)

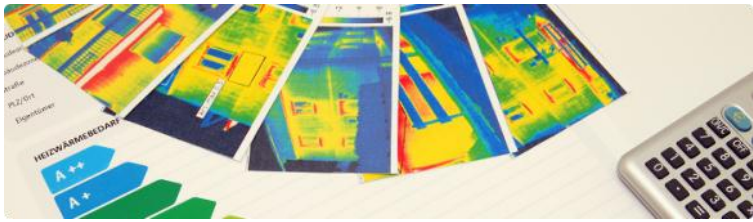
Community coach to shape and support the community of end users and organize a board of 'project ambassadors'.

Cross-cutting Success Factor 4

Draw Upon Community Dynamics!

Eueco (DE)

Standardizing community processes for local energy cooperations with a reliable IT support system



Crosscutting Success Factor 5

Test Before Roll-out: Ensure Functioning Technological Equipment!

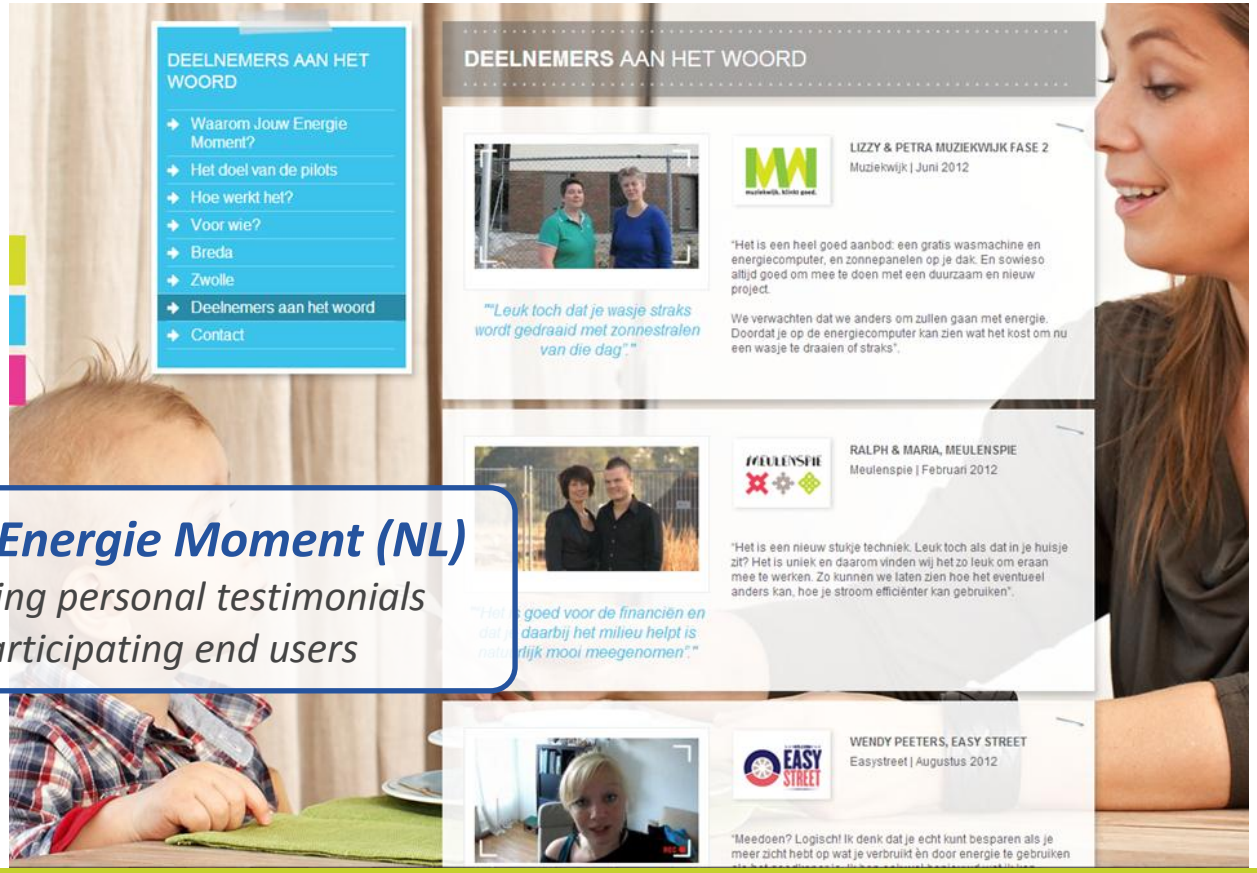
Technological Development

Design Phase	Adjustment phase	Implementation Phase
Include '**consumer'-experts** such as **social scientists**, but also trained **installers or customer service**	Plan a **friendly user trial** and qualitative interactions to detect malfunctions or flaws in the overall design.	**Rollout functioning equipment and be prepared for questions and concerns** of field test customers: Smooth processes are a prerequisite to acceptance

MOMA (DE) - Energy@home (IT) - Smart Metering Projekt (DE) – Linear (BE)

Cross-cutting success factor 6

Give personal attention and building trust over time!

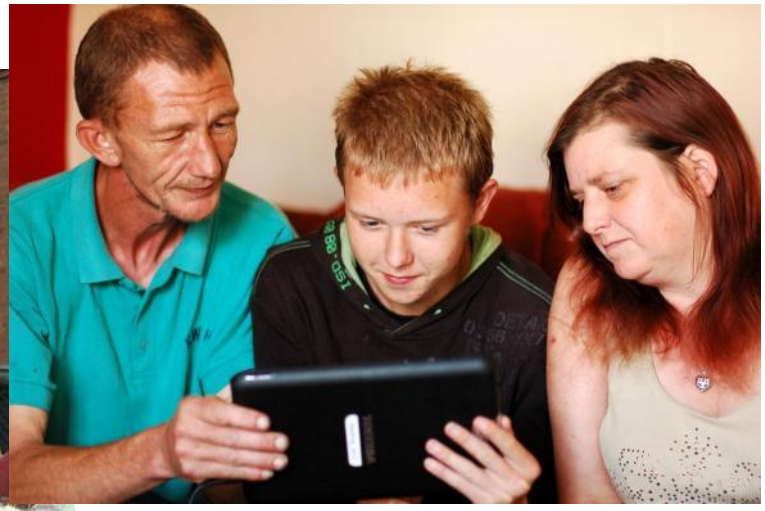


Jouw Energie Moment (NL)

Publishing personal testimonials from participating end users

Cross-cutting success factor 6

Give personal attention and building trust over time!



3e-Houses (DE/ES/UK)

Home visits to create interactions with vulnerable target groups (e.g. elderly, social housing residents)

3 - E HOUSES
Saving Energy & the Environment across Europe

Cross-cutting success factor 6

Give personal attention and building trust over time!

InovCity (PT)

Online forum with a Dr. Energia figure to humanise the relationship between supplier and consumer

Crosscutting Success Factor 7

Motivate End Users with Fun and Good News!

OSCAR (CH)

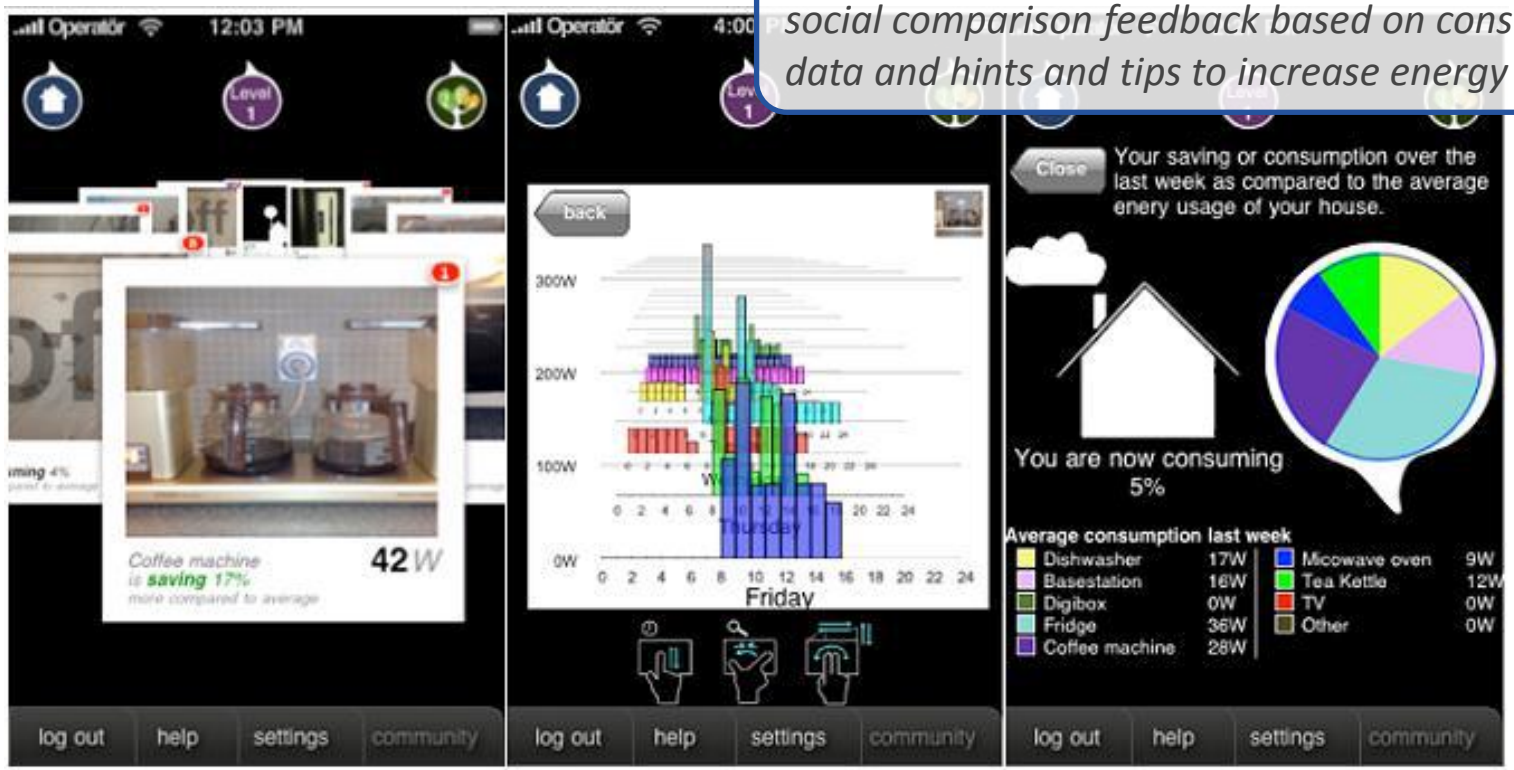
Gamification approach to foster energy awareness, provide hints and tips and to collect end user data.

Crosscutting Success Factor 7

Motivate End Users with Fun and Good News!

BeAware (FI/IT/SE)

EnergyLife game (smart phone app) provides playful social comparison feedback based on consumption data and hints and tips to increase energy awareness.



Opportunities to enhance end user engagement

1. Reinforce the end user perspective in the project design
2. Develop viable business models
3. Co-creation & gamification
4. Roll out smart grids towards the general public
5. Develop novel stakeholder coalitions
6. Connect smart grids to smart cities, smart living and sustainable lifestyles
7. Develop an overarching storyline to achieve a sense of urgency about smart grids

Thank you for your attention

- Deliverables available for download at:

  www.s3c-project.eu