



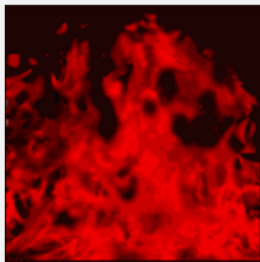
Falling Walls in Energy Economy

Ludwig Karg, B.A.U.M. Consult GmbH München / Berlin

Sustainable Energy: a wide field of challenges

Wind Virtual Electric Mobility
 Biogas Power Plants **Storage** Short-term buffering
 Sun **Generation** Market Roles Longterm Storage
 Regional Funds Market Design Hydrogen Gas
Organisation Flexible Grid Fees Hybrid Grids
 Incentives Flexibility Automation Super
 Prosumer **Consumption** Smart Grid Grid
 Acceptance Smart Home **Distribution**
 Energy Management Micro Grid DC grid

A new era of energies



era of fire



era of power

Walls ...

Walls ...

Supply

Demand

WE DONT NEED NO THOUGHT CONTROL

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.. are falling

.. are falling

Supply

Demand

Supply

Demand

Supply

Demand

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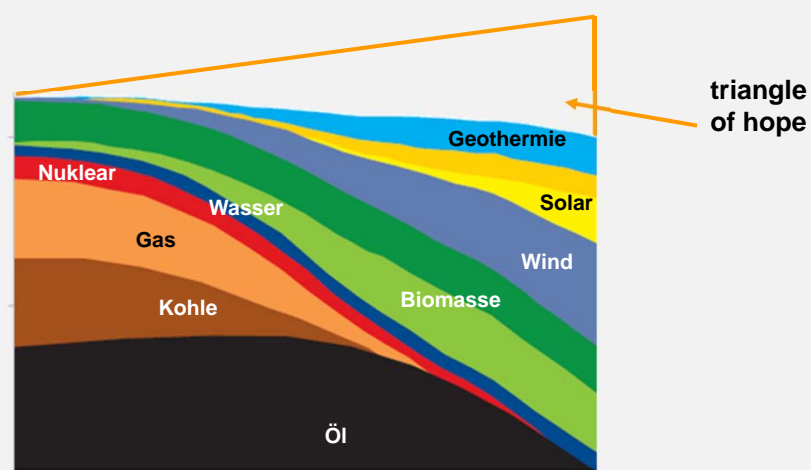
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Topics

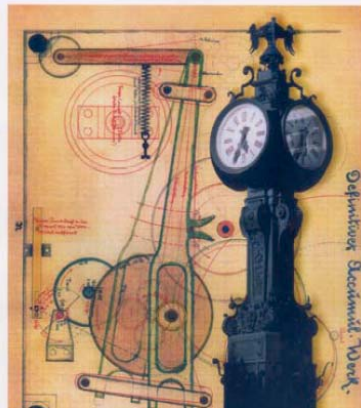
- Alternative Energy Sources
- The Smart Energy System
- A New Market Design
- It's about People

Wird es gehen?



Energy from air

Die autodynamische Uhr die Uhr mit selbsttätigem Luftdruckaufzug



source: Friedrich Ritter von Lössl

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Energy from the sea



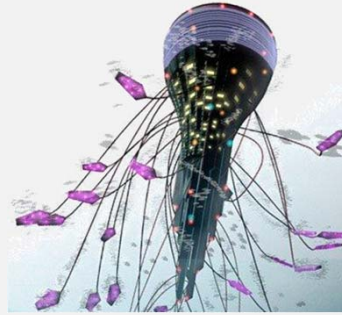
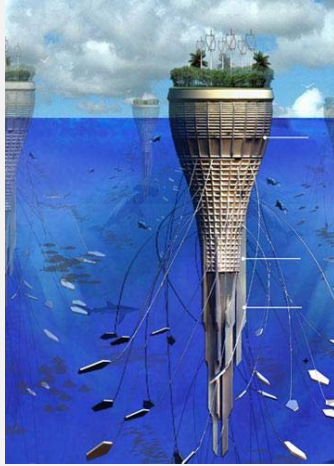
siehe thematisches Netzwerk WaveNet der EU

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H2O-Scraper: exploiting unexploited resources



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Energy and the Dance Floor

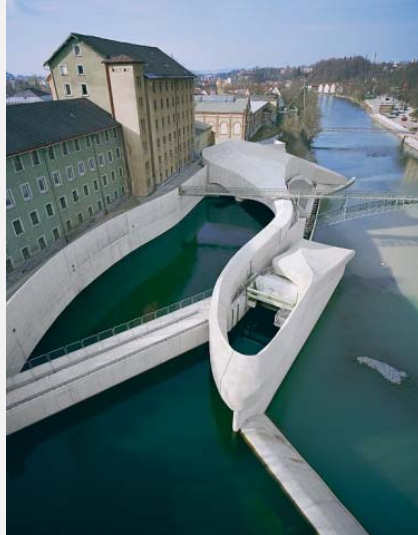


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Hydropower meets Art



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LifeCycle-Towers



source: Rhomberg Bau

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Green green Energy



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My home – my Energy Castle



- ▶ grid parity of PV!
- ▶ home energy management ...
- ▶ energy autarky?

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Topics

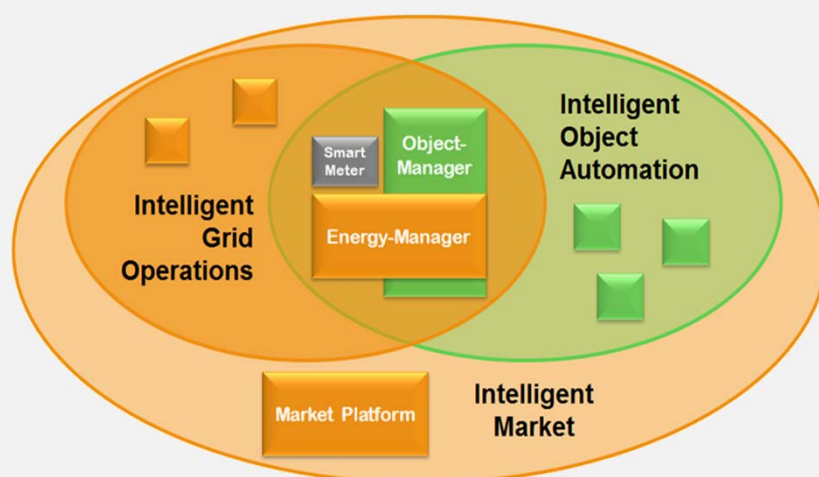
Alternative Energy Sources

The Smart Energy System

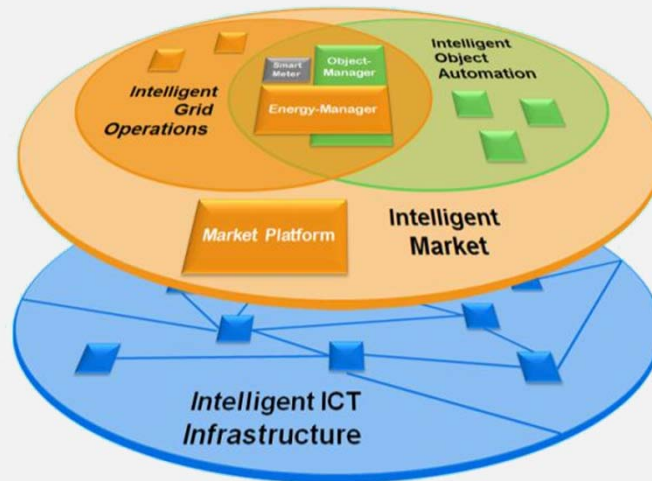
A New Market Design

It's about People

Integrating grids and homes



ICT - the Key Enabler

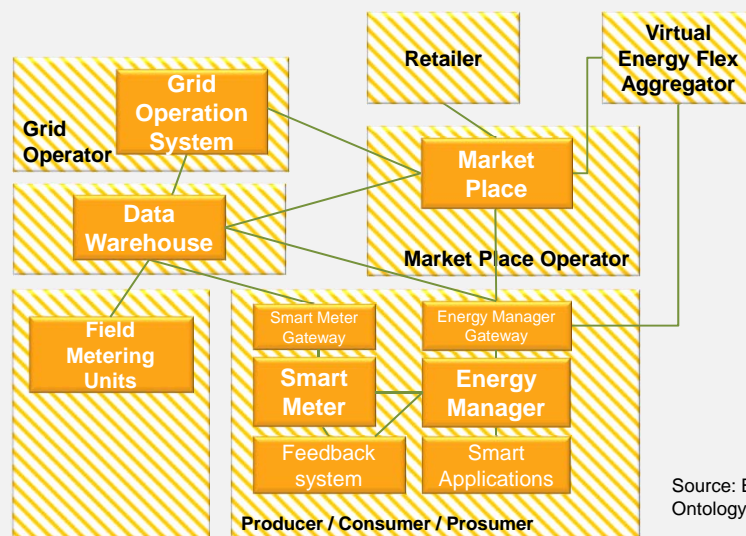


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Key Components

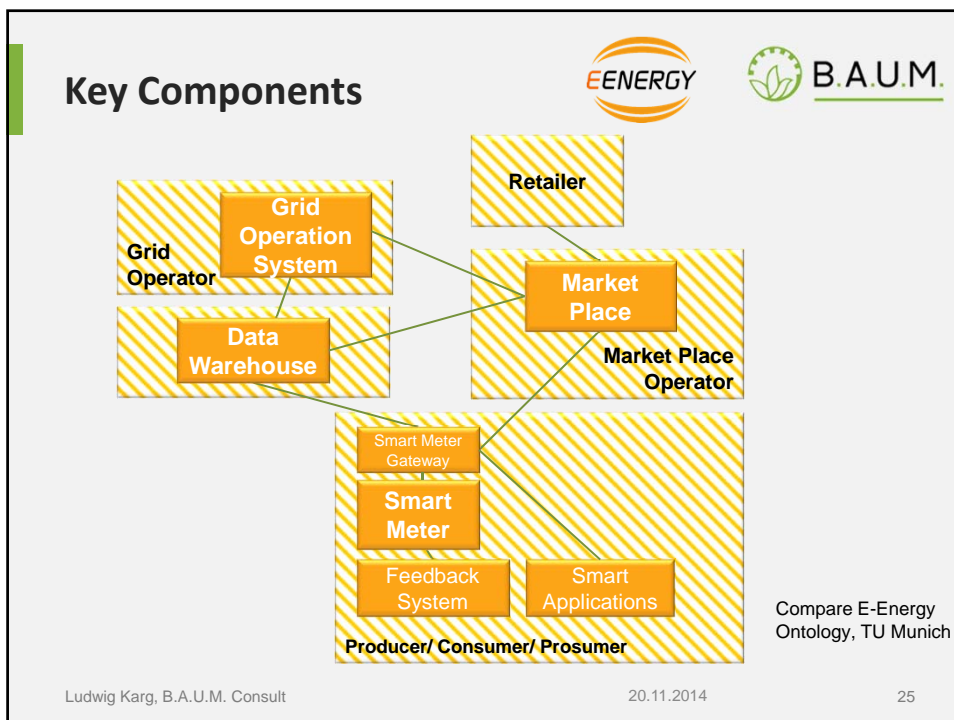
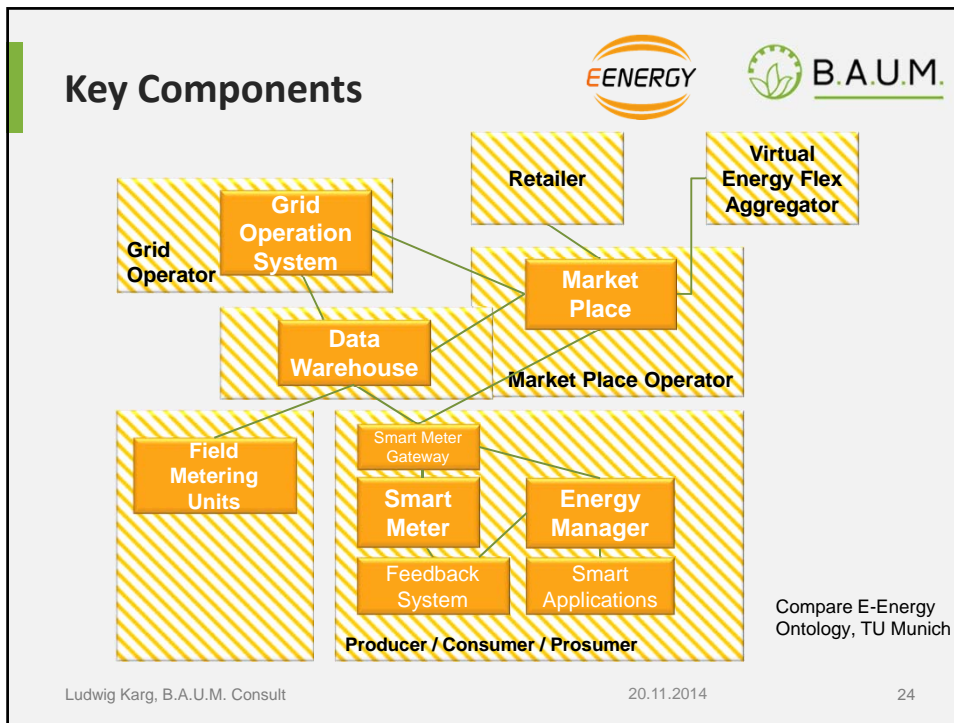


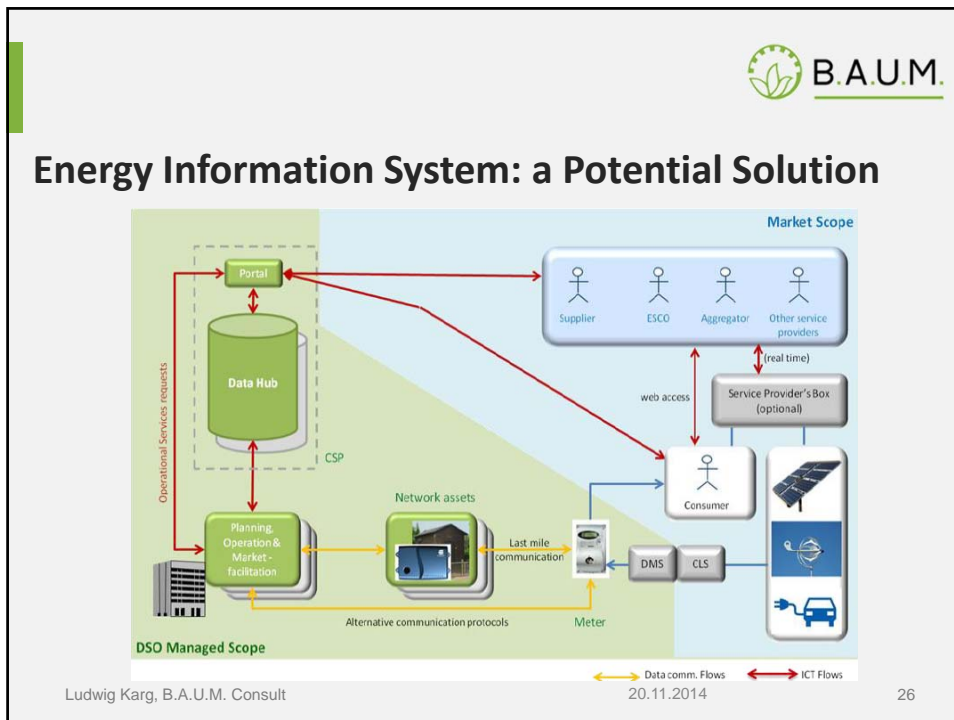
Source: E-Energy
Ontology, TU Munich

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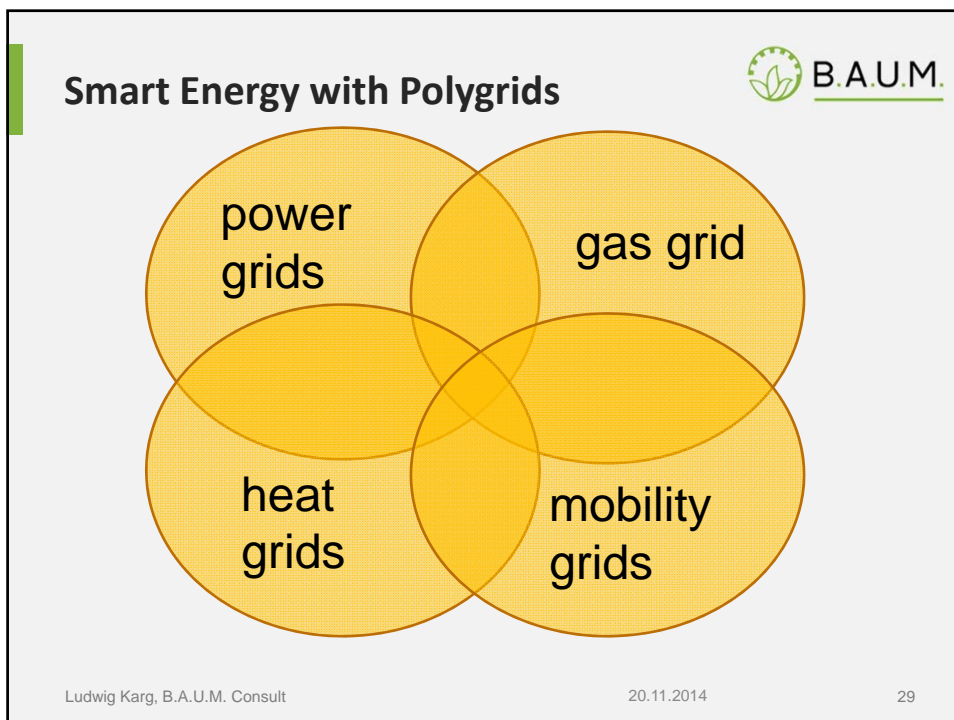
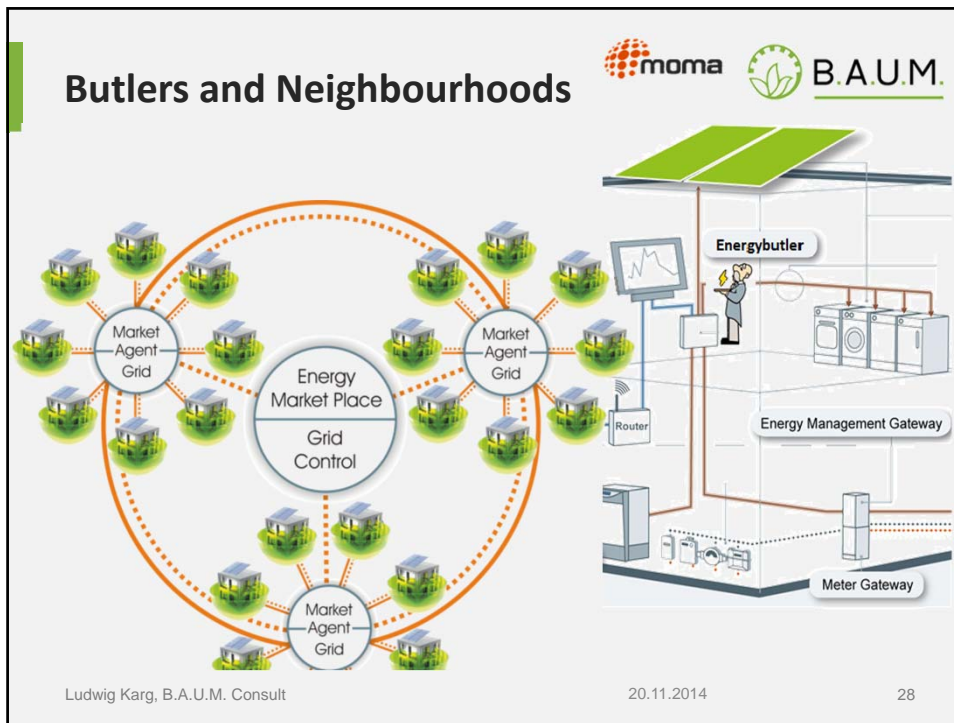

Smart Energy made in Germany

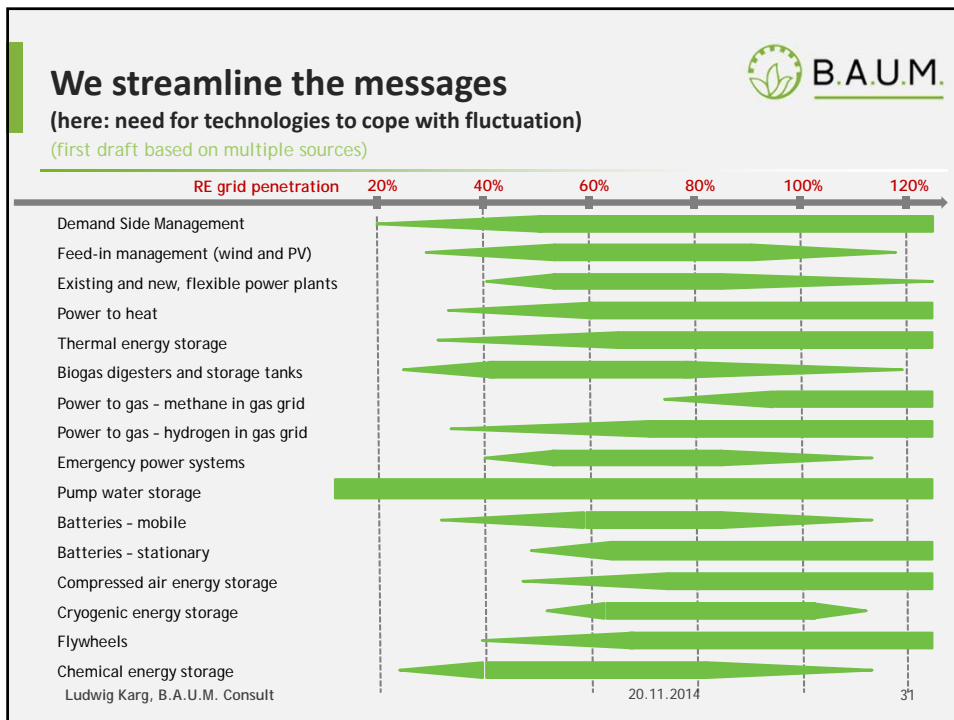
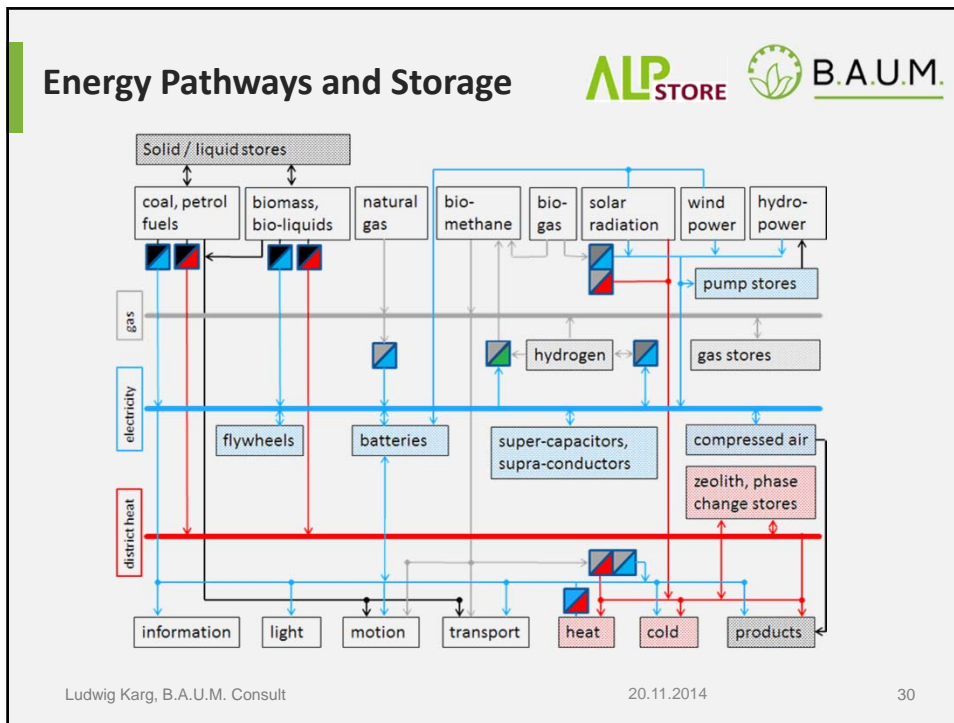
The slide features a video player on the left showing a man presenting. Below the video are navigation links:
 < to the E-Energy-Homepage
 < to the Congress-Page
 < back to portal

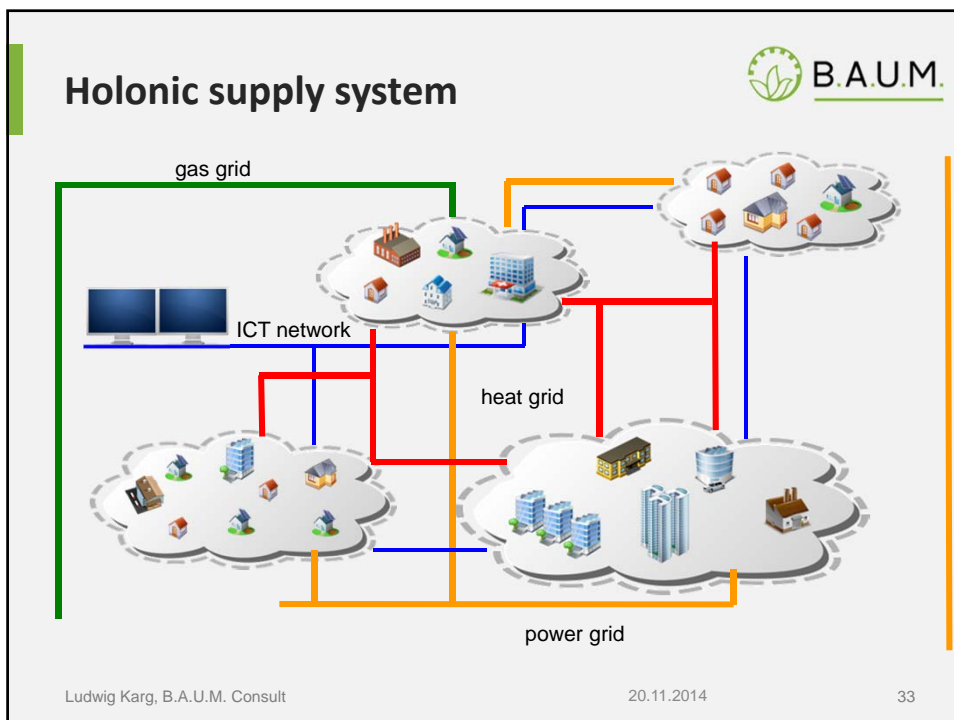
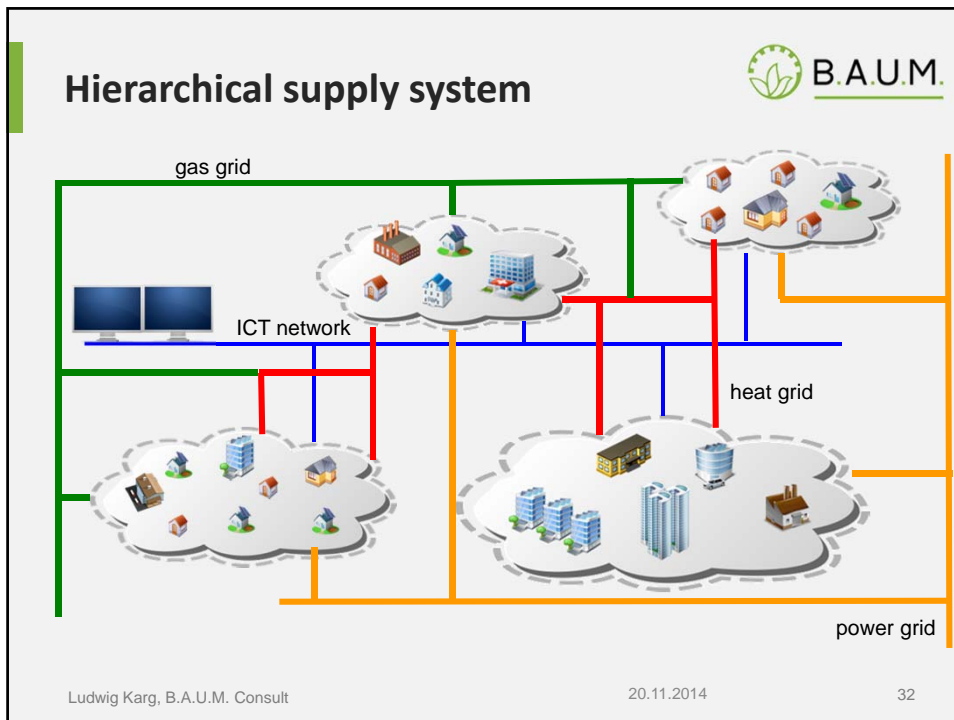
On the right, there is a **Präsentation** (Presentation) section with a thumbnail for **The Challenge**. Below this is a large graphic of a presentation cover titled **Smart Energy made in Germany**, which includes the text:
 13 Key Results
 E-Energy Programme

www.e-energy.de

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Topics


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Supported by:



Federal Ministry of Economics and Technology



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



Smart Energy: a System of Systems

Energy Information System

- cellular organism, de-central processing and control, encapsulation of errors
- central control, bidirectional communication to generation, storage and consumption
- central control, limited ICT with grid components, generation and consumption appliances

Energy Market System

big number of market participants using open market platforms

regulated oligopol, new services, new functions (e. g. flexibility operator)

monopol like market model

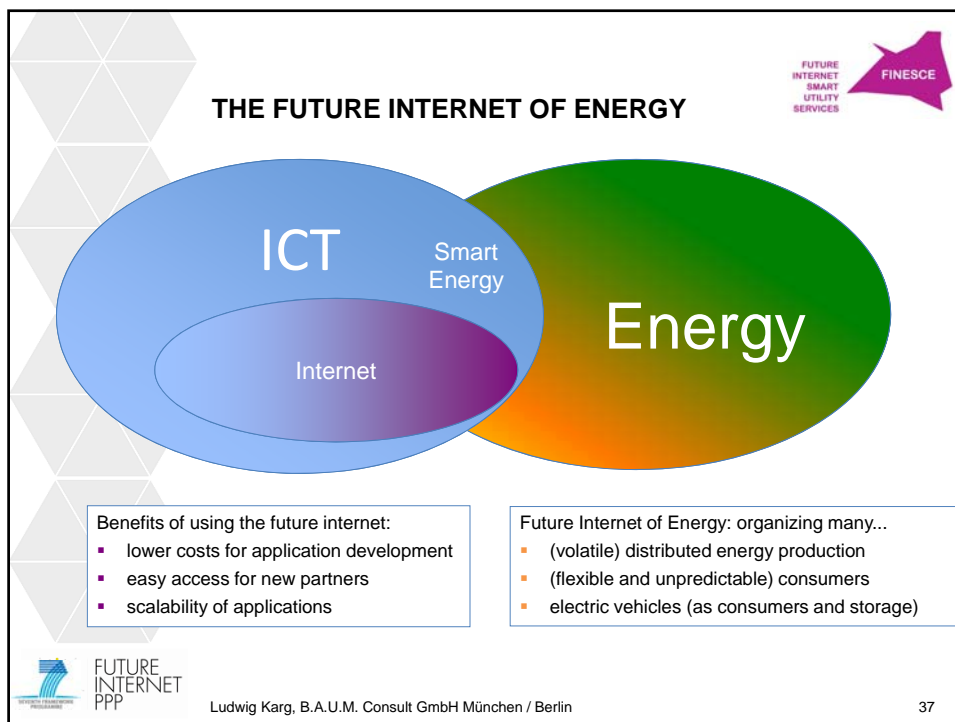
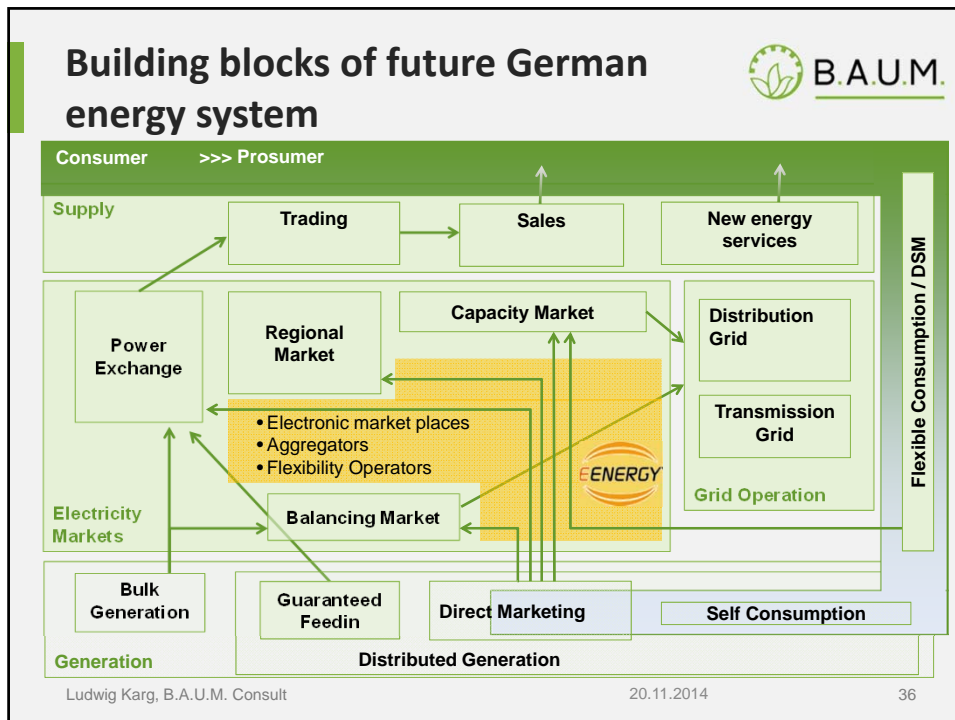
Energy Provision System

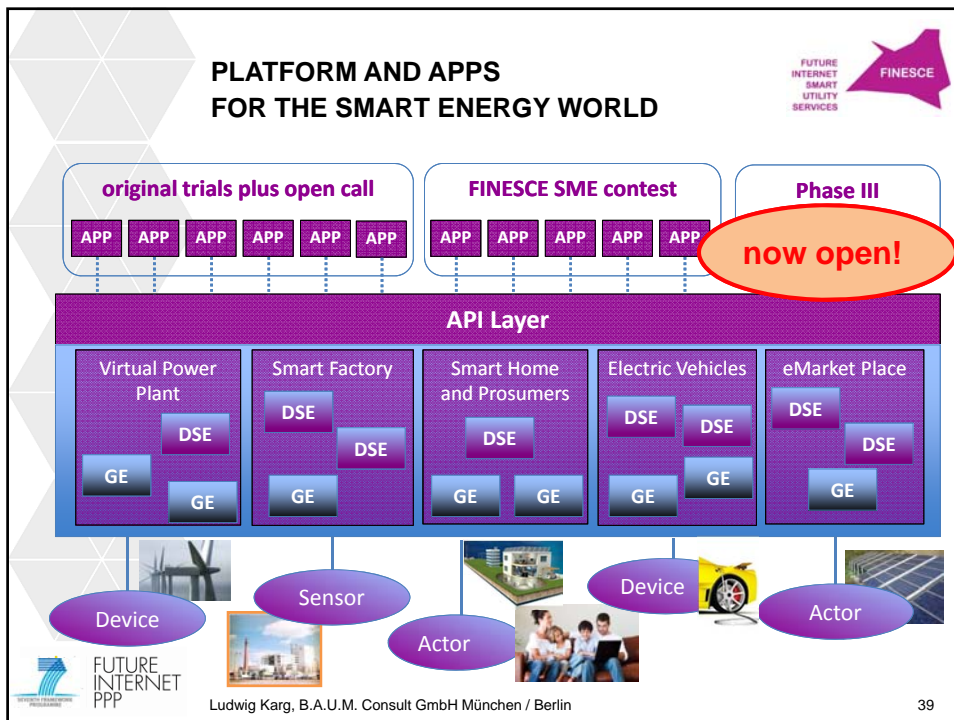
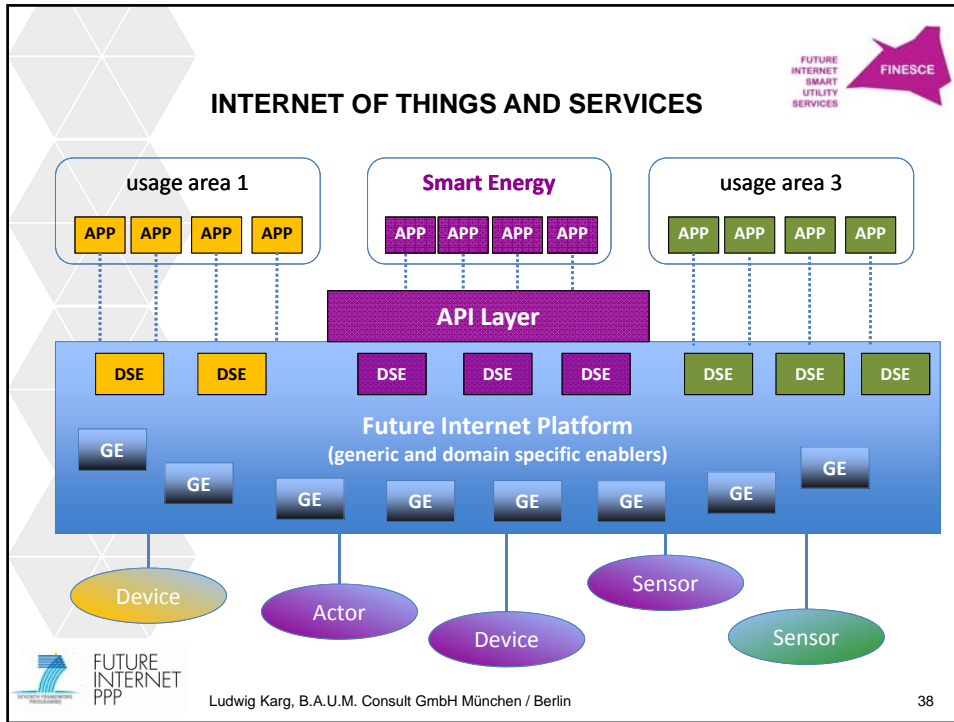
centralized generation, hierarchical grid

distributed generation, levelled optimization

cellular system with autonomous parts (e. g. micro or nano grids)

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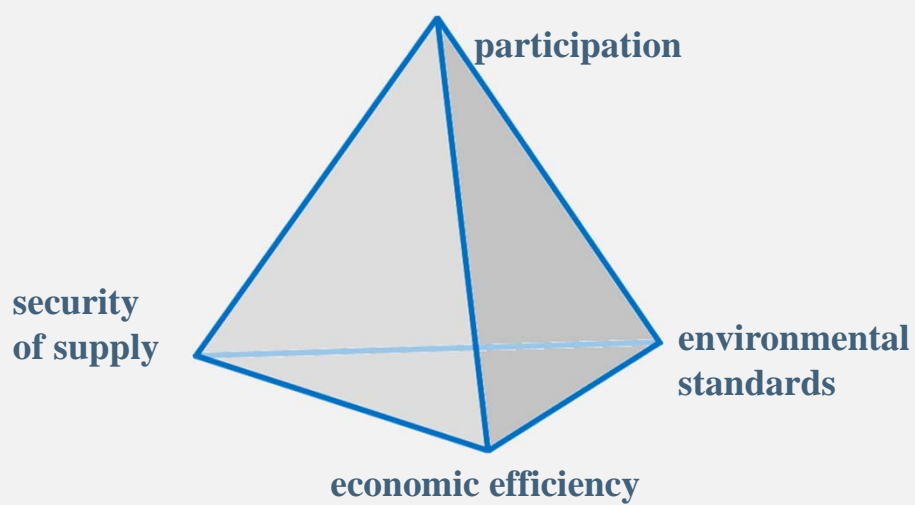





Topics

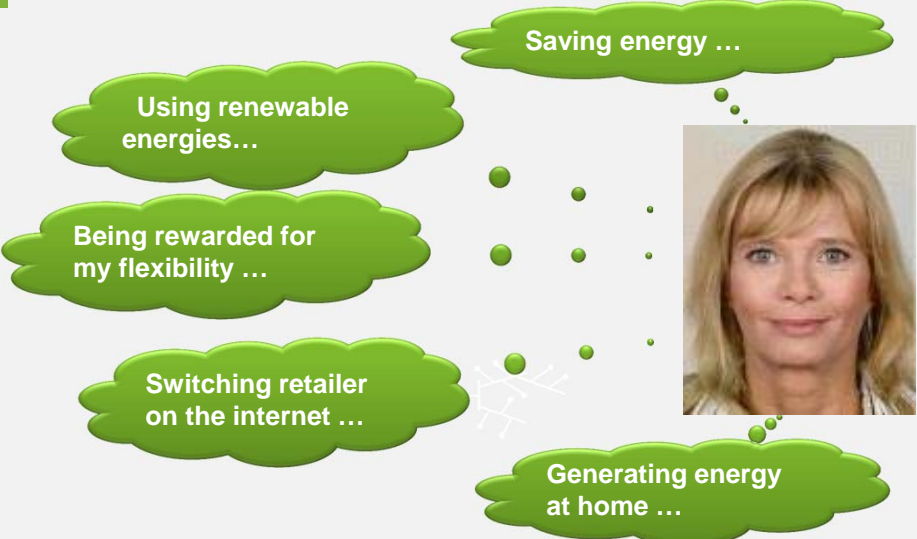
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The energy policy tetraeder



The smart consumer does exist

 B.A.U.M.



Using renewable energies...

Saving energy ...

Being rewarded for my flexibility ...

Switching retailer on the internet ...

Generating energy at home ...

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S3C


SMART **C**ONSUMER
SMART **C**USTOMER
SMART **C**ITIZEN

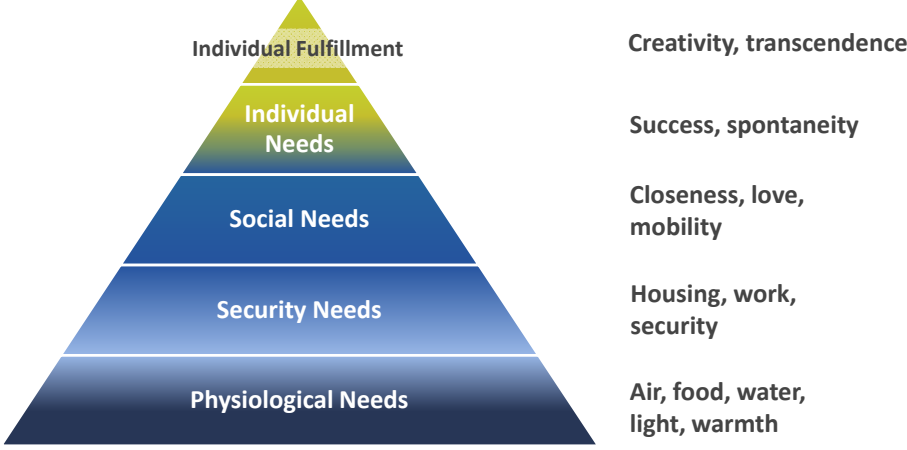
www.S3C-project.eu



SEVENTH FRAMEWORK PROGRAMME

Levels of Personal Needs




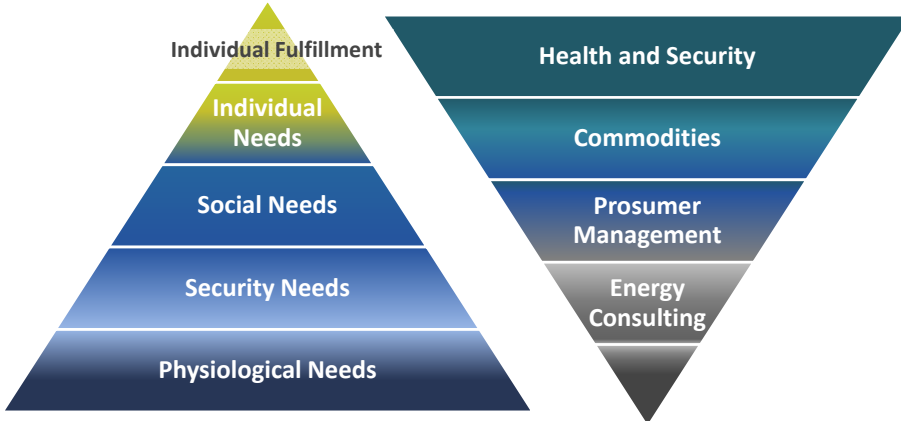


Individual Fulfillment	Creativity, transcendence
Individual Needs	Success, spontaneity
Social Needs	Closeness, love, mobility
Security Needs	Housing, work, security
Physiological Needs	Air, food, water, light, warmth

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Developing People-Centred Products





Individual Fulfillment	Health and Security
Individual Needs	Commodities
Social Needs	Prosumer Management
Security Needs	Energy Consulting
Physiological Needs	

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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.

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Getting people involved



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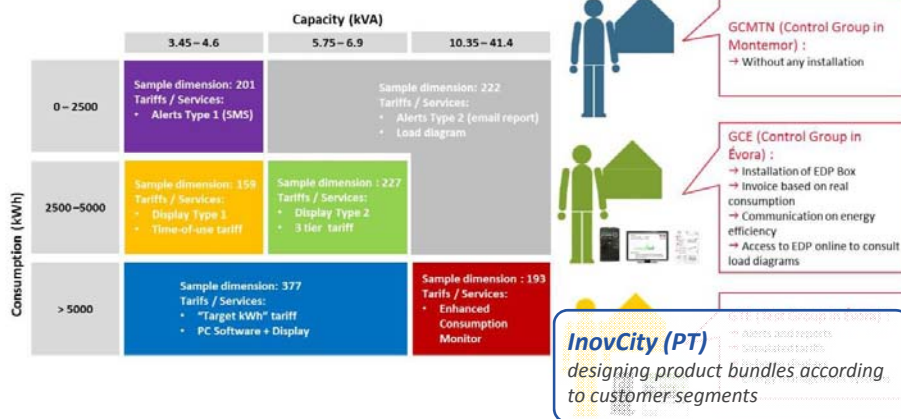
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Cross-cutting Success Factor 2



Obtain a Thorough Understanding of Your Target Group!



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Business models for the new energy world

**TARIFF
SHERIFF**



energy on the go

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Cross-cutting Success Factor 3



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



Texel, slim zelfvoorzienend
is slim samenwerken
op energiegebied

Texel Energie

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'

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Addressing the Citizen



Perth Solar City Campaign "Collective Impact"

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Cross-cutting Success Factor 4



Draw Upon Community Dynamics!



Eueco (DE)
 Standardizing community processes for local energy cooperations with a reliable IT support system

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Extreme direct marketing



Strom geben

Du betreibst im Keller, Garten oder auf dem Dach eines Hauses eine kleine Erzeugungsanlage und speist überschüssigen Strom ins Netz ein? Nutze buzzn und teile ihn mit Menschen in Deiner Nähe!

Mehr erfahren

Jetzt anmelden

Strom nehmen

Dir ist es wichtig, wen Du mit dem Strombezug für Dein Haus, Dein Büro oder Deinen Betrieb unterstützt? Wechsle zu buzzn und teile Deine Kaufkraft mit Stromgebern in Deiner Nähe!

Mehr erfahren

Jetzt anmelden



Die Dezentralität hat mich überzeugt.



Vielen Dank für Euren Einsatz!



Hervorragender Service!



Unser Strom jetzt bei mir zuhause!

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Wildpoldsried: the 2020 village in the Allgäu

IRENE



B.A.U.M.



- ▶ 2.500 people
- ▶ 2.500 cows
- ▶ 9 windmills, biogas plant
25.000 m² PV
- ▶ 50 full electric vehicles
- ▶ controllable substation
- ▶ 400 kW battery
- ▶ 180 PMUs



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Sharing Economy



B.A.U.M.

What we share ...



... and what we don't



Quelle: Sharity – Die Zukunft des Teilens;
Gottlieb Duttweiler Institut, Studie Nr. 39, 2013

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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)

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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

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The Utility of the Future!?

•polarstern Okostrom & Okogas Die Idee Über uns **Botschafter & Community** Blog Service Kontakt Kundenbereich

Wir glauben, jede gute Idee ist eine Bewegung...

...kein Zustand. Erst durch unsere Freunde, Unterstützer, Fans und Botschafter wird Polarstern lebendig. Wir werden nur gemeinsam etwas verändern, nur gemeinsam die Zukunft gestalten. Hinter Polarstern steckt keine schlaue Formel oder große Theorie, sondern viele einzelne Menschen, die zusammen etwas bewegen wollen. Durch unsere Botschafter zieht die Idee von Polarstern immer weitere Kreise. Als Unterstützer sehen wir jeden, der über uns spricht, schreibt, singt, blogt oder diskutiert. Wir glauben an die Kraft der Polarstern-Community. Du auch?

Polarstern-Botschafter

Wir werden von herausragenden Persönlichkeiten unterstützt, die uns und viele andere inspiriert haben. Jeder von ihnen hat seinen ganz eigenen Grund sich bei Polarstern zu engagieren

Polarstern Energie

Freitag gibt's Zeugnisse. Polarstern Okostrom zählt laut ÖKO-TEST zu den allerbesten Okostromtarifen in Deutschland: Wirklich nachhaltig erzeugt, wirklich

Polarstern Energie

3.724 Personen gefällt Polarstern Energie.

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Crosscutting Success Factor 7



Motivate End Users with Fun and Good News!

Start

Ich bin Oscar!
Ich bin der Energie-Spezialist der BKW. Ich sehe zwar aus wie ein normaler Bär, kann aber weit mehr als ein Durchschnittsbär. Ich helfe Ihnen, Strom zu sparen. Und Strom sparen ist gleich Geld sparen. DABE...

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Freunde von Polarstern

Freunde einladen



Zählerstand eingeben



Erinnerung setzen




Meine Energie


Smart


Aufgaben


Spartipps


Quiz


Gewinnspiel


Forum



WALDBÜHNE GAME 2013

20875 Punkte

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

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