

SaaS-U Model - Innovation Case for the Energy Industry

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Demographic dynamics



- **Population growth**
7.5 bill. in 2020 (+1.1 bill.)
- **Megacities**
27 megacities (>10 mill. people) by 2025

Source: UNO

Scarce resources



- **Geopolitics**
70% of global oil and gas reserves are located in just a few countries
- **Price volatility**

Climate change



- **Global endeavors**
Political programs aimed at long-term reduction in CO₂ emissions

Increase of society's electrification equals to rising energy consumption

Shortage of fossil energy resources results in:

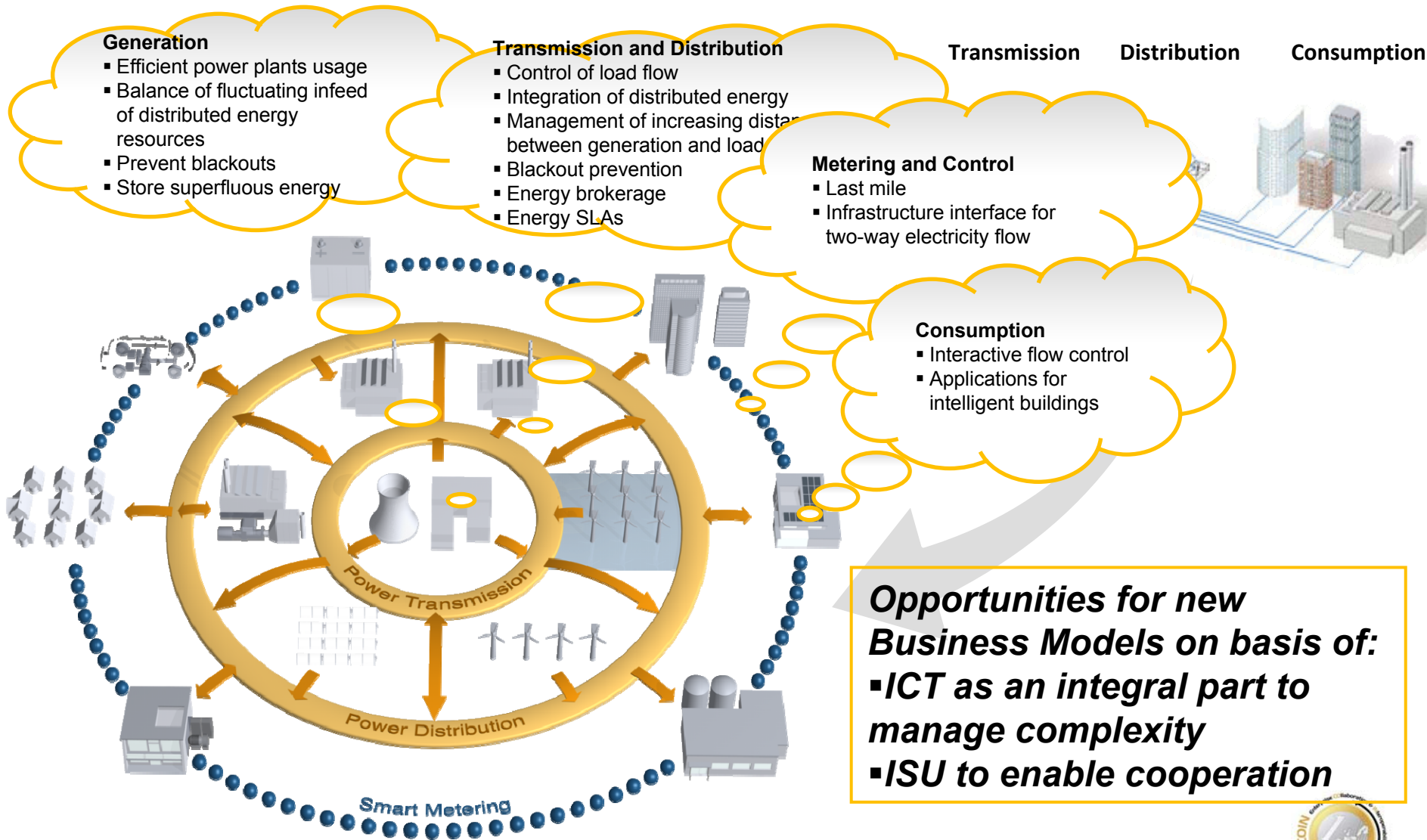
1. Demand for energy efficiency
2. Substitution with **alternate energy resources**

Environmental awareness triggers demand for "clean" and renewable energy solutions

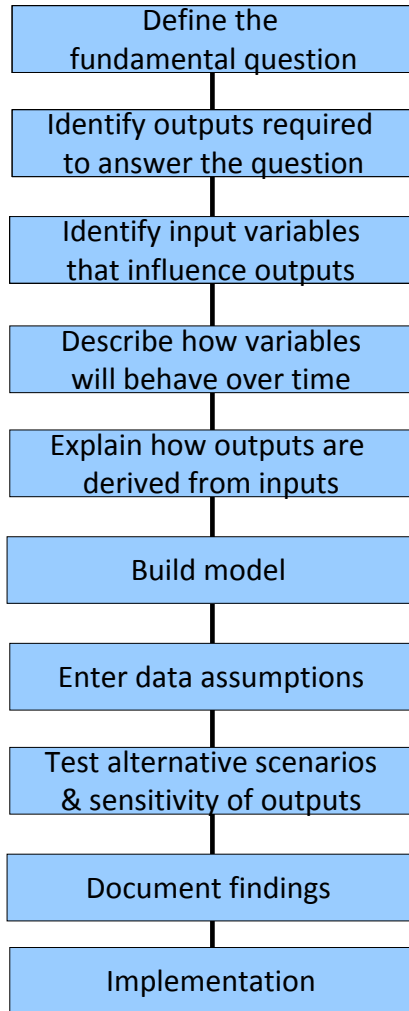


Paradigm shift in the energy sector

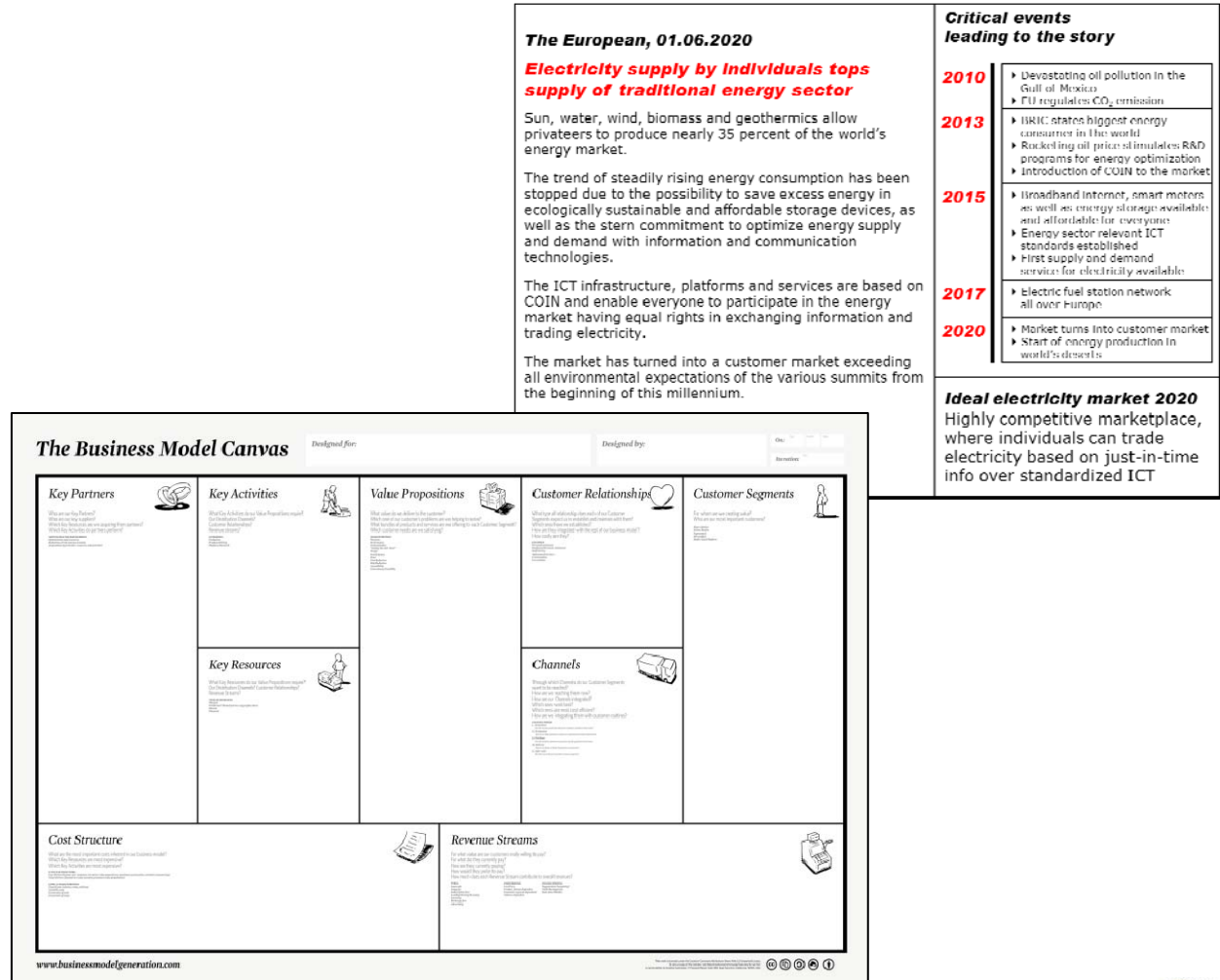
2011



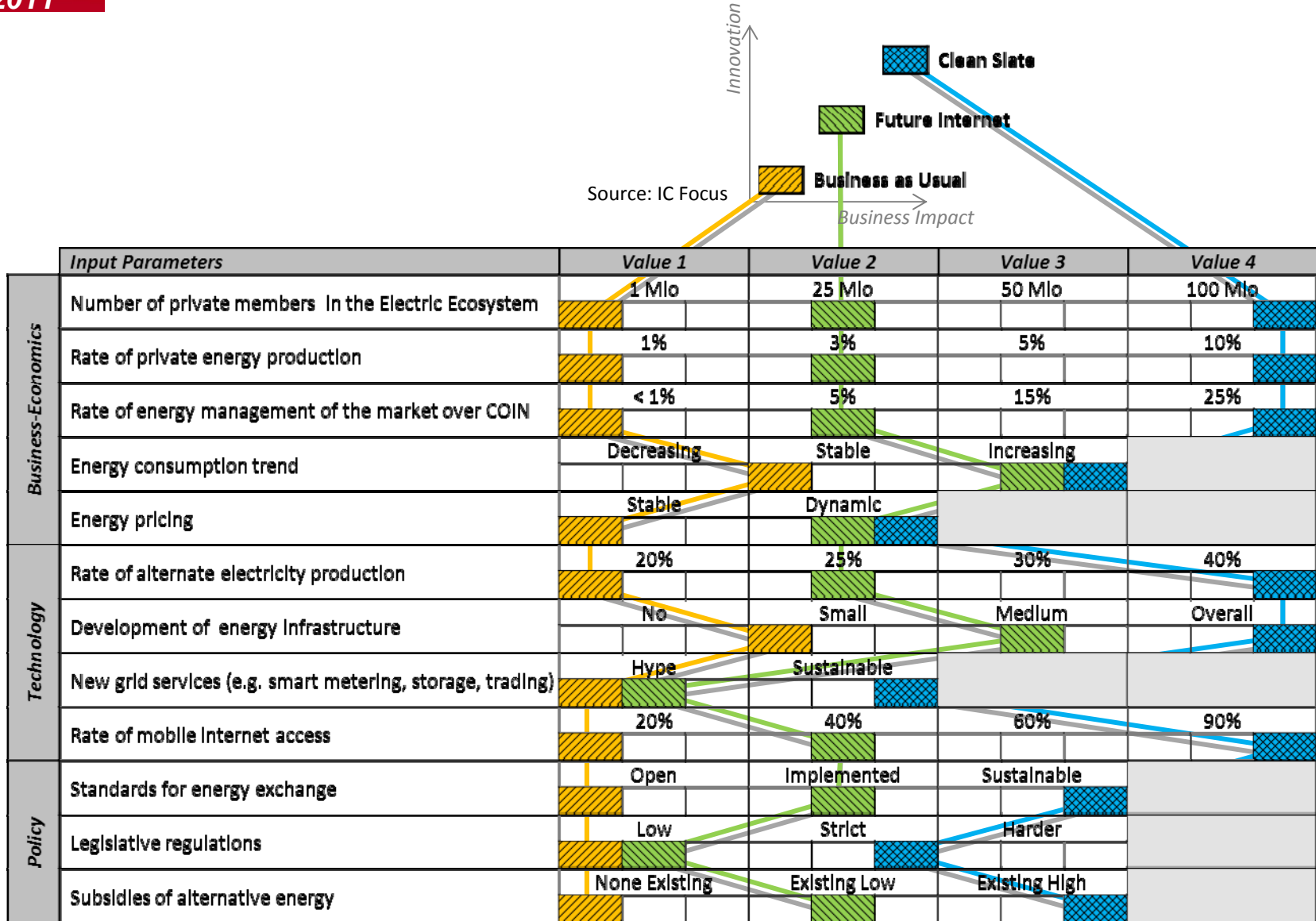
Research approach, Methodology



Source: IC Focus



Business Model Scenarios



2020 - The Green Slate Scenario

- Analysis of daily load distribution per customer (prerequisite: smart meters)
- Forecast of energy prices
- Forecast of energy consumption for a customer (e.g. heating depending on season, weather) based on regression data analysis
- Recommendations for a customer how to distribute energy consumption over the day
- For energy “prosumers”: forecast of ideal time slots for energy production (e.g. wind turbine, solar collector) based on meteorological forecast
- For energy “prosumers”: show energy demand of customers in your proximity
- For municipalities: comparison of energy supply and demand within the municipality (energy planning support)



You say you want a revolution
Well, you know
We all want to change the world

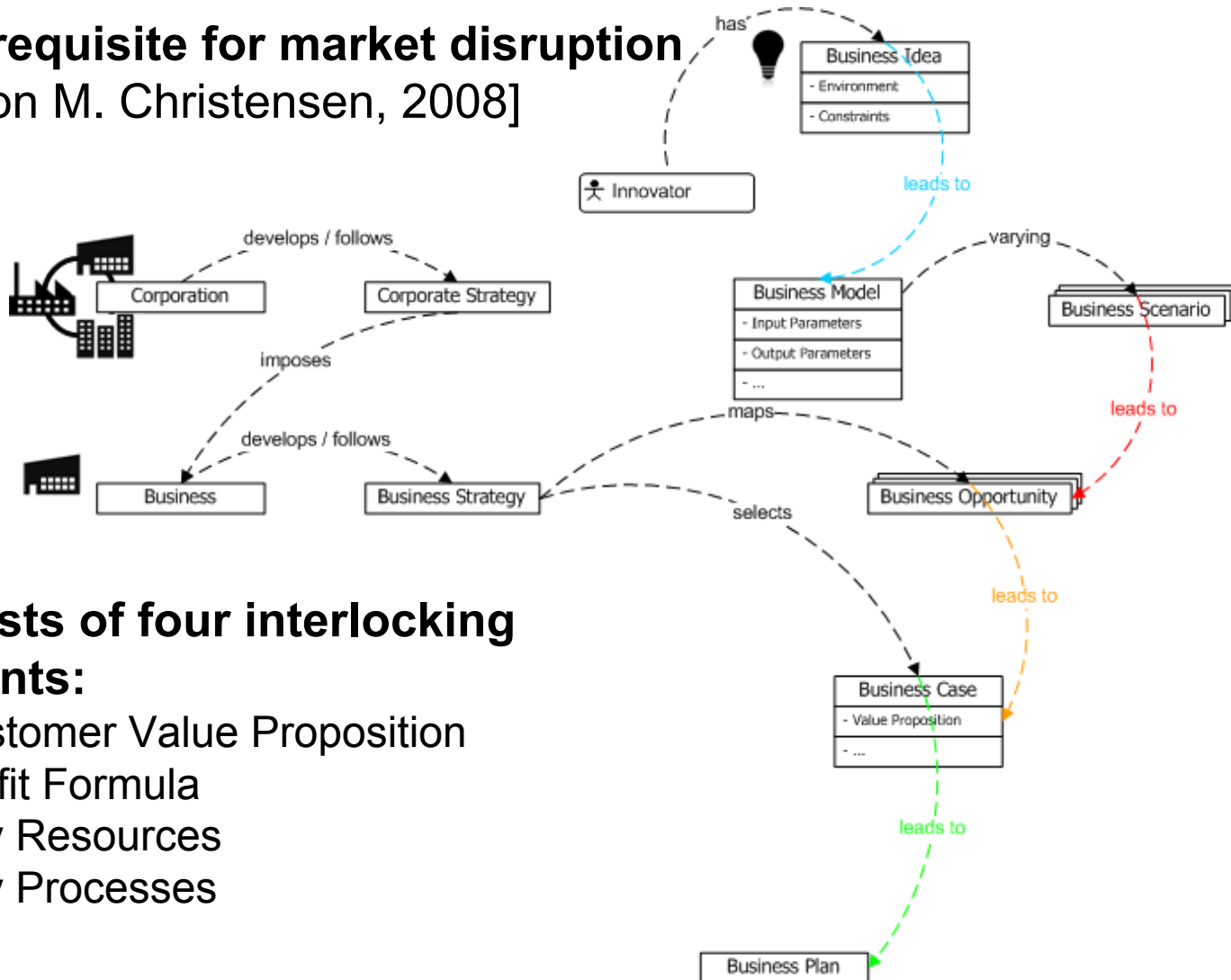
You tell me that it's evolution
Well, you know
We all want to change the world

*Lyrics of the song "Revolution",
Lennon/McCartney, 1968*



Photo by Bruce McBroom / © Apple Corps Ltd.

- **A Prerequisite for market disruption**
[Clayton M. Christensen, 2008]



- **Consists of four interlocking elements:**

- Customer Value Proposition
- Profit Formula
- Key Resources
- Key Processes





Business Model Decomposition



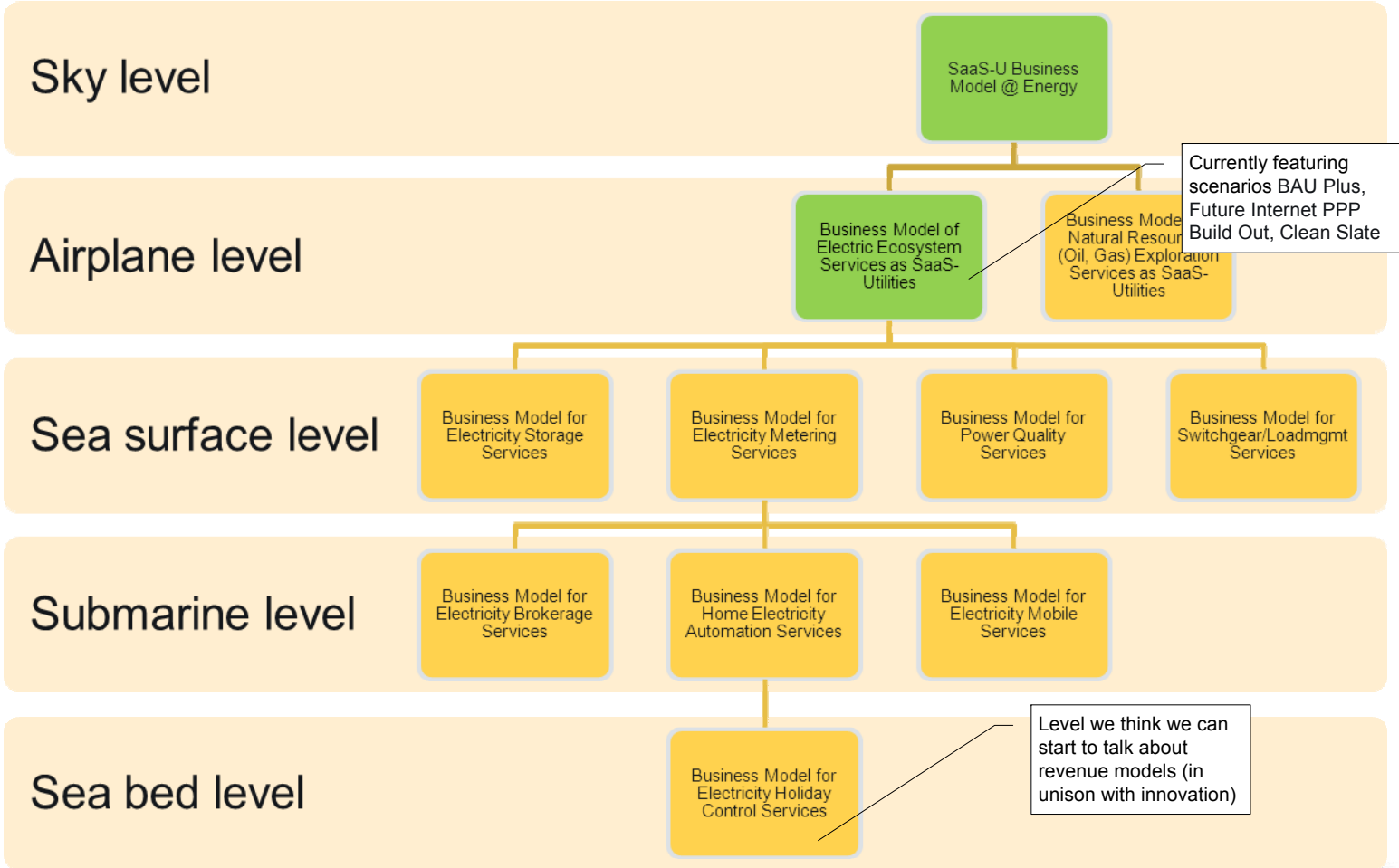
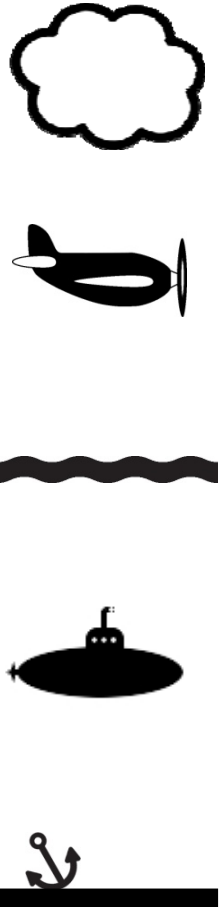
- **Different levels of business model granularity** ranging from the abstract, very high level business model (like the SaaS-U Business Model @ Energy) to the quite concrete, very low level business model (like providing a service sending someone to wipe the leaves from the photovoltaic cells of a private household that generates/uploads less power than it could)



- Bottom-up vs. top-down **approach**, or a combination of both approaches **when elaborating a business model**
- Innovation levels' similar behavior?!



SaaS-U Business Models @ Energy Granularity Levels



Companies are starting open innovation ...

2011

SIEMENS

<http://www.smartgridcontest.com>


imagination at work

<http://challenge.ecomagination.com>

SIEMENS
Smart Grid Innovation Contest

Home | Contribute | Ideas | Community | About the Contest | My Area

Join the grid - energize the world!

Welcome to the Siemens Smart Grid Innovation Contest!

The world around us is changing. To lower CO2 emissions, we need to rely on renewable energy sources. For that, the current energy network needs to become more flexible and intelligent. A Smart Grid! >

1 Contribute > 2 Vote & Discuss > 3 Get Rewarded >

Latest Ideas > see all

- This invention proposes ... by Vinod Subramanian ★★★★★
- High-efficient cy Multi-In ... by Johne Brooke ★★★★★
- Hamster colonies powered ... by Stephan Herr ★★★★★
- Our Idea > My Business ... by tripti narang ★★★★★

Latest Members > see all

- Awas Oarni PAKISTAN
- Muhammad Faem Akhtar PAKISTAN
- Patrik Tokoš CZECH REPUBLIC
- Kliment Stevanoski MACEDONIA

Timeline > learn more

Go Live 13-04-2011 | End of Contest 31-05-2011 | Jury Meeting 21-07-2011 | Meeting of winners in Berlin | Start of Call-for-Proposals 04-10-2011 | End of Call-for-Proposals 30-11-2011 | Jury Meeting January 2012

Contest News & Events

- 01.05.2011 Taiwan is most visiting the contest
- 28.04.2011 Number of members is rising quick!

Contest Info

- 101 Ideas
- 425 Members
- 350 Evaluations
- 368 Detailed evaluations
- 170 Comments

Watch the teaser again

siemens.com Global Website | m.siemens.com Mobile Website | © Siemens AG 2002-2011 - Corporate Information | Privacy Policy | Terms of Use | Digital ID | Contest Terms and Conditions

ecomagination®

POWERING YOUR HOME | POWERING THE GRID | BLOG | HAVE A GREAT IDEA! >

826 IDEAS | 12,563 COMMENTS | 72,035 USERS

Winners To Be Announced Soon!

Now that the ecomagination Powering Your Home Challenge has come to a close, the judges are evaluating the entries so that we can fund the most promising innovations for the future of home energy. Check back soon to meet the Challenge winners!

Most supported ideas:

- Solar Roadway Home Quadrator
- Lowest Loss Fresnel PV Concentrator

Ideas with the most comments:

- SmartGrid Rooftopstar - 8 kW-volt solar is very economical and aesthetically pleasing for roofs
- Affordable, effective and aesthetic solar thermal heating & cool A/C

Top Challenge Users

From Twitter

Green - Jobs RT @EarthTeachingWave Energy brings Oregon Green Jobs <http://bit.ly/kjy9E6> 3 days ago

March 15th: Let the Building Bright! Today marks the official close of OE's ecomagination Challenge: Powering Your Home, and it's... @19357_Consensus

March 16th: Better Late Than Never! All we approach the end of the Powering Your Home Challenge on March 15th, it's very exciting! @87_Consensus

From the Blog

Episode 5 of the GE Show: SOLAR WATCH NOW >

featured community member

SmartSolar Commented 4 days ago: SmartWeed Rooftopstar - 8 kW-volt...

A Home Electrical "Inlet" - Instead of Only Outlets

Name: [prabowee](#)
Location: Houston TX

Overview: A standardized electrical inlet panel, could allow owners to easily plug-in any number of renewable energy sources. How about a decorative energy-generating windmill? Or add a solar panel? Maybe even an exercise bike that feeds energy back into your house? Over time, all these little waste add up!

Submitted: Feb 1, 2011

Companies are starting to touch the topic ...



Save energy. Save money. Make a difference.

Get Google PowerMeter

Track your energy usage. Use less. Save energy & money.



How much energy are you using right now?

Control your PowerCost Monitor

Energy Cost Breakdown by Your Area

This house could save up to: **\$1,938 per year**

Monthly Energy Cost Component Breakdown

PowerCost Monitor



imagination at work

Powering Your Home

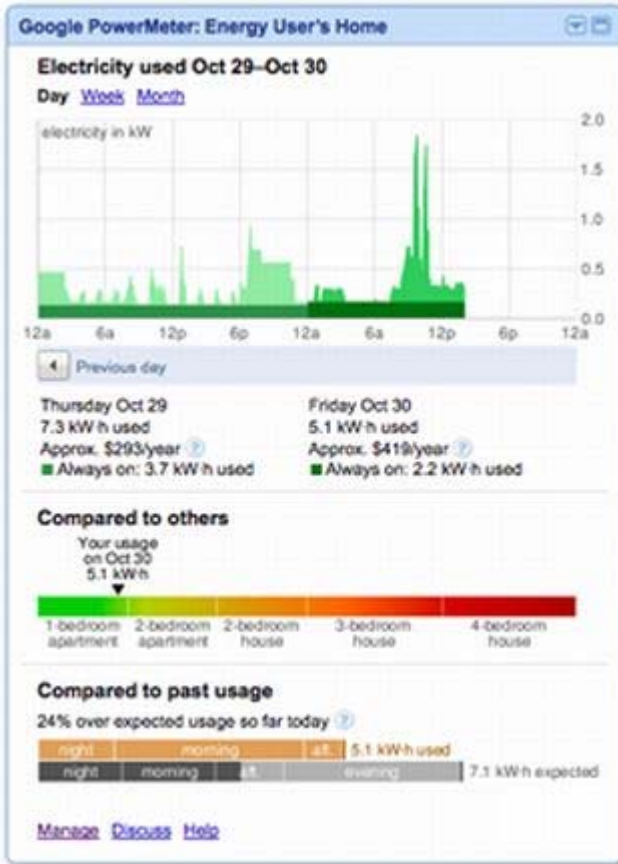
Trusting Your Home

Energy-saving tips and home appliance images.

A Home Electrical "Inlet" - Instead of Only Outlets



For example: Google's Powermeter



“While smart meters enable automated reading and accurate collection of consumption data by utilities, as well as deliver of detailed consumption data to consumers ... communications can be interactive, empowering consumers to adjust their behaviors and energy usage according to data about rates, complementary services and other factors.”

„... energy usage awareness will also motivate consumers to obtain programmable devices and use any available dynamic pricing, and help drive down longer-term consumption trends.“

„... by creating a platform for information exchange, it is likely that – as with the Internet – there are numerous other applications, devices and services that have not yet been conceived and that will spring from the energy information exchange enabled by intelligent devices.“

„Enabling ... this two-way flow helps stimulate competition for services and promotes greater consumer choice.“

„... these opportunities will require ... a smarter energy infrastructure“

Source: Comments of Google Inc.
GN Dkts. 09-51, 09-47, and 09-137



Another example: Microsoft's Hohm

Energy Cost Breakdown In Your Area*



Heating	\$885
Lighting	\$109
Appliances	\$331
Water Heating	\$253
Other	\$361
Total	\$1,938

View your Energy Breakdown

Monthly Energy Cost Comparison Example



Top Ways to Save

This house could save up to

\$1,938 per year



- \$367** **Slipping Through the Cracks**
 Hidden air leaks can add up to as much air loss as an open window! You could save 10 percent on energy bills by getting them sealed.
- \$297** **AFUE Good Men**
 New gas furnaces sport an AFUE number that rates their efficiency. Higher is better—look for an AFUE of at least 90 percent.
- \$139** **Duct Tales**
 Having your heating ducts sealed by a pro could make your home less stuffy and improve air quality. You could save significantly on heating and cooling, too.

“... consumers can ... start the process of predicting, monitoring and eventually managing energy use. Microsoft also plans to offer an API for third-party vendors to build devices and software.”

“... Hohm as the first step to working with smart devices and ultimately moving into the control layer for energy systems, either working with utilities to turn down appliances with smart plugs or developing smart charging software.”

„Hohm is free to consumers, but Microsoft plans to charge utilities for services eventually, likely when it moves more into the energy control systems. The energy industry is a strategic business area that Microsoft is moving into. “

Source:

<http://gigaom.com/cleantech/chart-google-microsoft-energy-smackdown-powermeter-vs-hohm>



What will the future look like?

2011

Large centralized power plants still supply the majority of power demand

CO2 emissions are constantly on display

Renewables supply 30% of power demand

Micro generation as part of smart buildings

Car-parking for plug-in vehicles, buy or sell electricity shaving peak loads

Very large and very small generation plants need to be managed in parallel

Wireless sensors and smart metering coupled to load management and market driven energy supply software

Storage plants buffer volatile generation



CO2 Footprint
2:66 Sell 35:51
1:98 Buy 2:2

You say you got a real solution

Well, you know

We'd all love to see the plan

You ask me for a contribution

Well, you know

We're doing what we can

*Lyrics of the song "Revolution",
Lennon/McCartney, 1968*



Photo by Bruce McBroom / © Apple Corps Ltd.

Thank you

Acknowledgement

This presentation and the preceding paper is based on work performed in the project COIN (EU FP7 Project 216256; <http://www.coin-ip.eu>) funded by the European Union within the ICT Work Programme of the Seventh Framework Programme and on research by Siemens. The presenter and the authors would like to thank all partners in the COIN consortium as well as their Siemens colleagues for their contribution.



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