

Introduction to Energy Trading and Global Trends

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Introduction to Energy Prosumer



➤ Energy prosumer

- The term prosumer is a combination of **Producer** and **Consumer**.
- An energy prosumer is a person who consumes energy directly while producing energy.
- If energy production is higher than consumption, **producer mode** is used.
- Consumption mode is changed to **consumer mode** when energy consumption is higher than production.

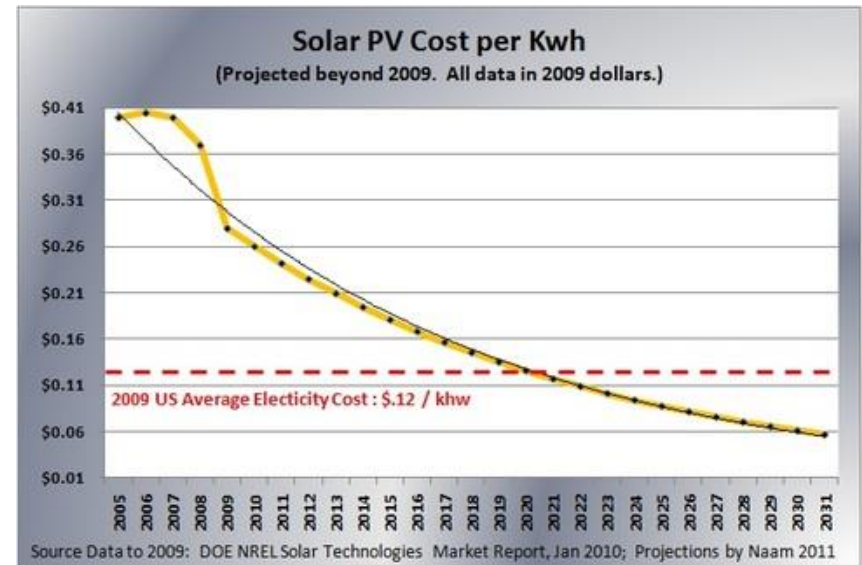
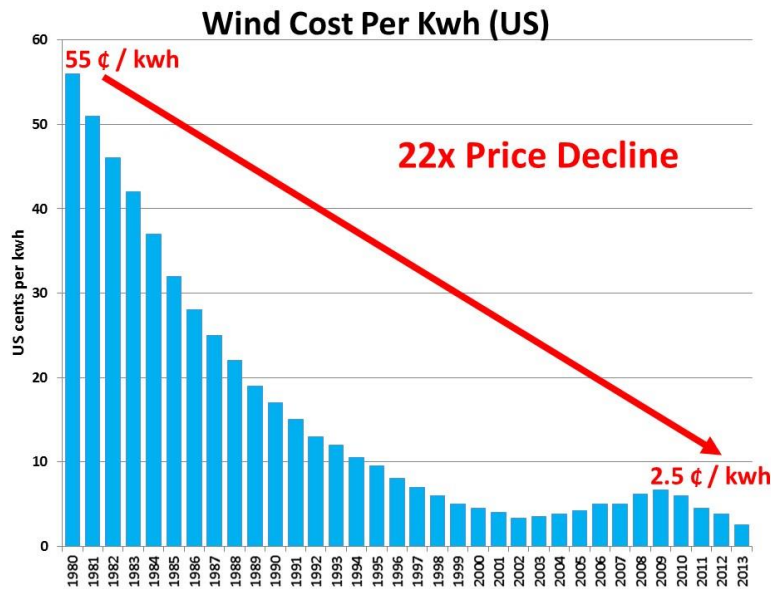


Background of Energy Trading (1/2)



➤ Economic factor

- The price of renewable energy decreases.
- Especially, unit prices for wind power and solar power generation are falling significantly.



Background of Energy Trading (2/2)



➤ Environmental factor

- The need to raise awareness of the environment caused by climate change and secure the right to self-government of energy has been highlighted.

➤ Technical factors

- Renewable energy, batteries, electric vehicles, and ICT technologies are driving the spread of energy trading technology.



20%

LESS CO₂ EMISSIONS
vs. 1990



20%

MORE RENEWABLE
ENERGY USE



20%

LESS PRIMARY
ENERGY USE vs. BAU*

By the year
2020

*Business As Usual

Business Model for Energy Trading in Korea



➤ Town Type

- The town type is a business model in which a prosumer located in a certain area sells electricity remaining in nearby electric consumers by utilizing KEPCO's electric power facilities under the intermediary of KEPCO.

➤ Apartment Type

- Apartment type is a business model in which a resident of a high-voltage comprehensive contract apartment unit installs a new and renewable power source through joint investment and allocates the generated electricity to an equal ratio

Changing Business for Prosumer



	Today		Tomorrow
Energy flow	Unidirectional	➔	Bidirectional
Grid	Few to Many, hierarchical	➔	Many to many, mazed
Parties	Consumers, Producers Suppliers, Markets, DSO & TSO	➔	Consumers, Producers, Prosumers, Broker, Markets DSO & TSO
Role of customer	Energy Consumption	➔	Consumption, Production, Storage
Portfolio E-supplier	Energy Supply, Trade Customer care & Billing	➔	Risk management, Balancing, Settlement, Trade, Customer Care & Billing, Asset management, Advisory
End user Price	Fixed , fuel based	➔	Volatile, weather based
Risk at	Supplier	➔	Prosumer, Broker
Margin based on	Revenue- Energy costs- internal costs	➔	Balancing/Risk management, Transaction based margin
Forecasting	Relevant for supplier	➔	Relevant for Prosumer & Broker

Changing business characteristics – the business transformation ahead

Source: Peter Hermans (2011)

Energy Trading Trends Overseas



- **EU's SCANERGY Project**^[1]
 - A scalable and modular system for energy trading between prosumers
 - SCANERGY system enables the smart energy trade between prosumers, while coping with the inherent real-time dynamism in electricity demand and supply.

- **Ready4SmartCities**^[2]



- **Design4Energy**



[1] <http://scanergy-project.eu/>

[2] <http://www.ready4smartcities.eu/>

Energy Trading Trends Overseas



- Online Platform for Interpersonal Electricity Trading
 - Piclo (England), Vandebbron (Netherlands), SonnenCommunity (Germany)







vandebbron ONZE ENERGIEBRONNEN OVER ENERGIE OVER ONS SERVICE & CONTACT

Jouw verbruik: **wijzig**

2.850 kWh Enkeltarief

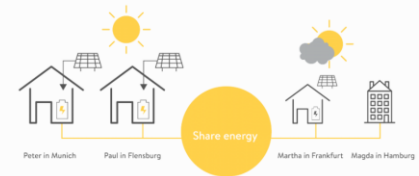
1.200 m³ Nederlands aardgas

Kies de energiebron die bij je past en Vandebbron zorgt dat je geld bij deze bron terecht komt

 <p>Windenergie van Windpark Roggeplaat, Burgh-Haamstede</p> <p>392 Beschikbaar Bespaar €142,35 per jaar * € 116,58 per mnd</p>	 <p>Uitgelicht</p> <p>Windenergie van Windpark Kneesweg, Anna Paulowna</p> <p>77 Beschikbaar Bespaar €142,32 per jaar * € 116,56 per mnd</p>	 <p>Uitgelicht</p> <p>Zonne-energie van Solar Campus Purmerend, Purmerend</p> <p>927 Beschikbaar Bespaar €124,91 per jaar * € 118,01 per mnd</p>
 <p>Windenergie van windpark A4, Weteringbrug</p> <p>673 Beschikbaar Bespaar €135,42 per jaar * € 117,14 per mnd</p>	 <p>Windenergie uit Molkwerum, Molkwerum</p> <p>20 Beschikbaar Bespaar €128,35 per jaar * € 117,73 per mnd</p>	 <p>Windenergie van Arie Noordermeer, Middenmeer</p> <p>6 Beschikbaar Bespaar €128,35 per jaar * € 117,73 per mnd</p>


What is the sonnenCommunity?

The sonnenCommunity is a community of sonnenBatterie owners who are committed to a cleaner and fairer energy future. As a member you can share your self-produced energy with other members of the sonnenCommunity. Since you are exclusively using energy from the community, there is no need for a conventional energy provider anymore.



Introducing Piclo®

Piclo® is a new kind of marketplace that enable households and businesses to transact peer-to-peer with local generators.



Energy Trading Trends Overseas

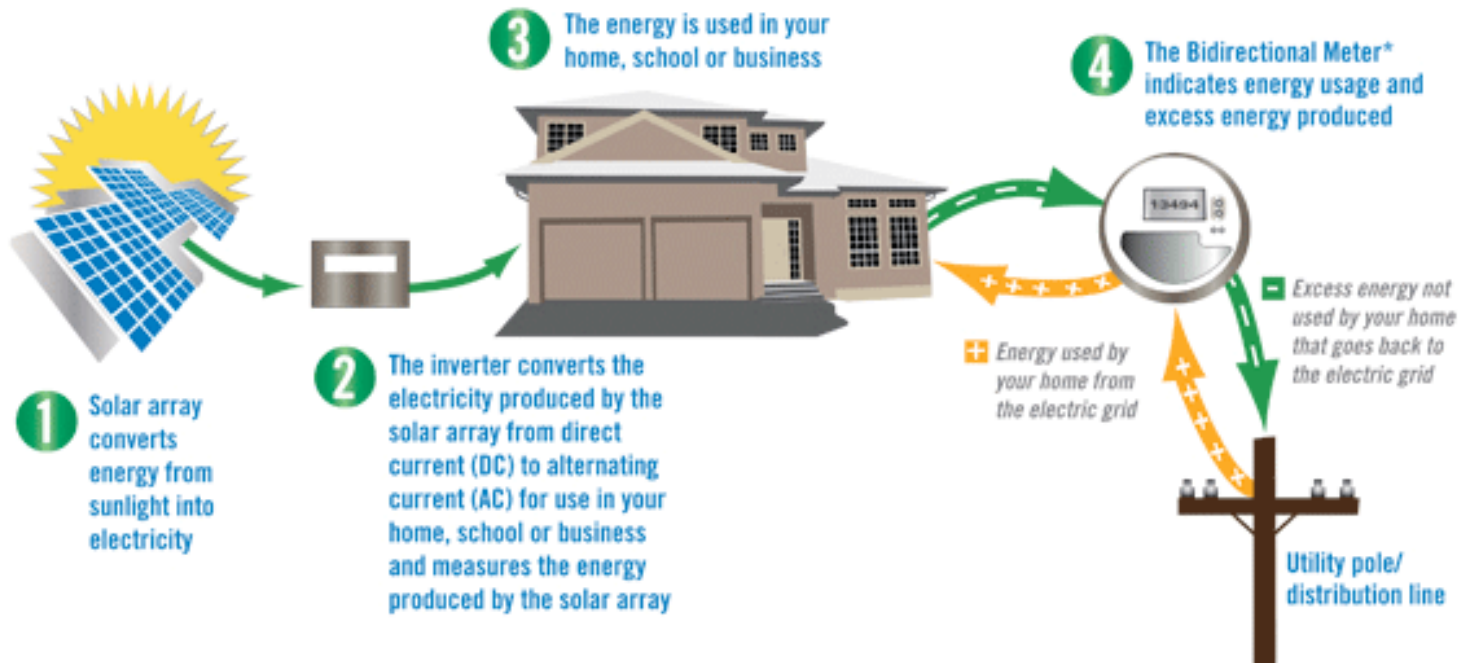


➤ US Net-Metering System



Understanding NET METERING

Solar Photovoltaic Array Example



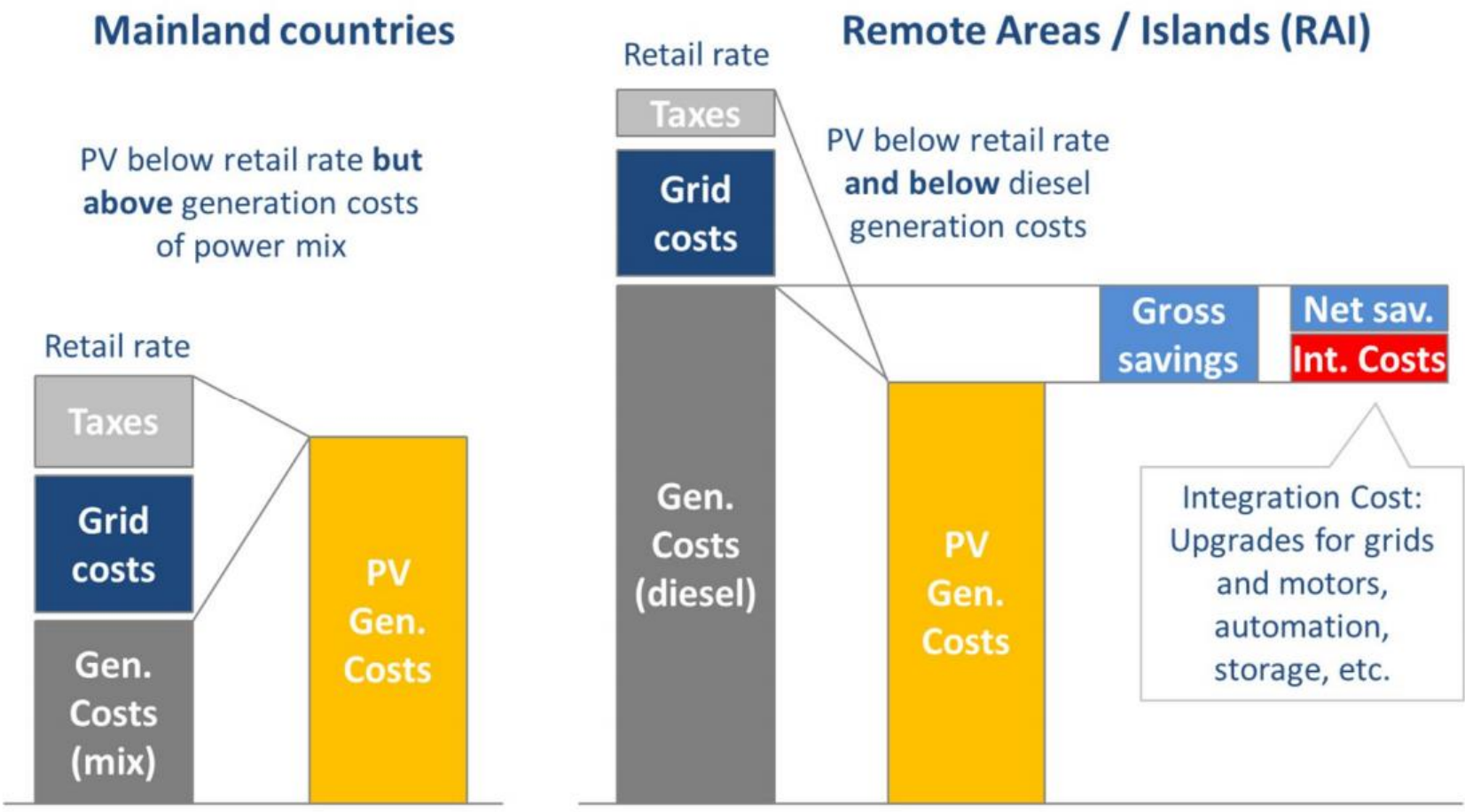
Example of need policy for activating prosumer



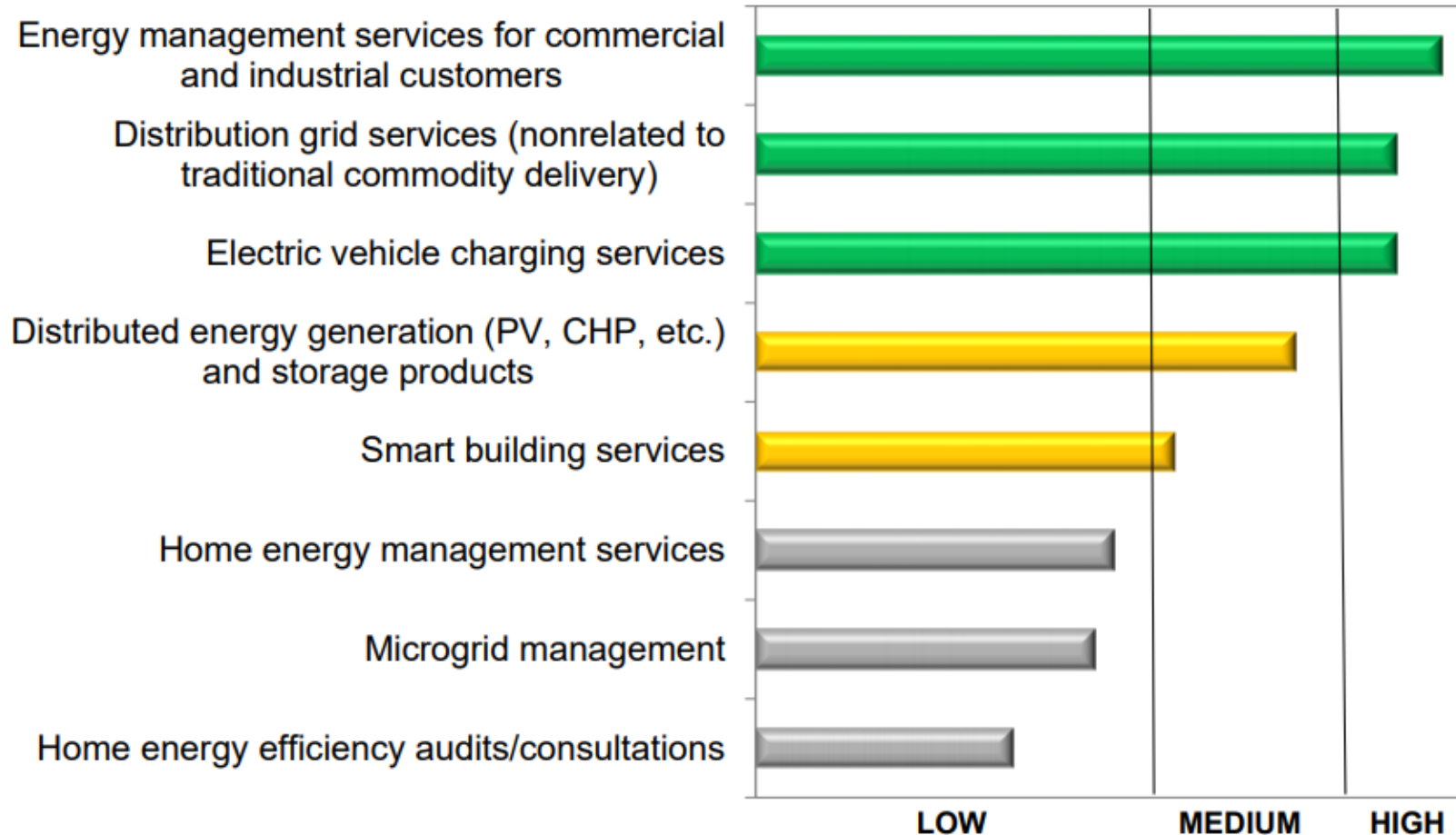
- **International Energy Agency (IEA)**
 - Due to lack of conditions, it is expected that prosumer will appear in the next few years
- **Compensation system**
 - All sale / purchase or hybrid net metering etc.
- **Fee design**
 - Time-based differential rate system, electricity rate system with no basic fee, etc.
- **Revenue guarantee**
 - decoupling of utility income, loss preservation system, etc.
- **Market structure**
 - allowing peer-to-peer power sharing, facilitating new business models
- **Tax Reform**
 - tax benefits for solar systems or investments



Electricity cost comparison mainland country vs. RAI



New Revenue Stream Generators in European Utilities*



* IDC Energy Insights, "Designing the New Utility Business Models" (2015.10)

(KAIST OLEV) Introduction



(KAIST OLEV) Commercialization



- KAIST Shuttle in KAIST, Pilot service in Gumi/Sejong City with Dongwon OLEV
- **Advantages**
 - Non-contact wireless charging system, there is no danger of electric shock accident.
 - Convenient and highly usable buses that can be charged without the influence of weather such as snow and rain.
 - Proven Economy



THANK YOU
