



Distributed Energy Generation

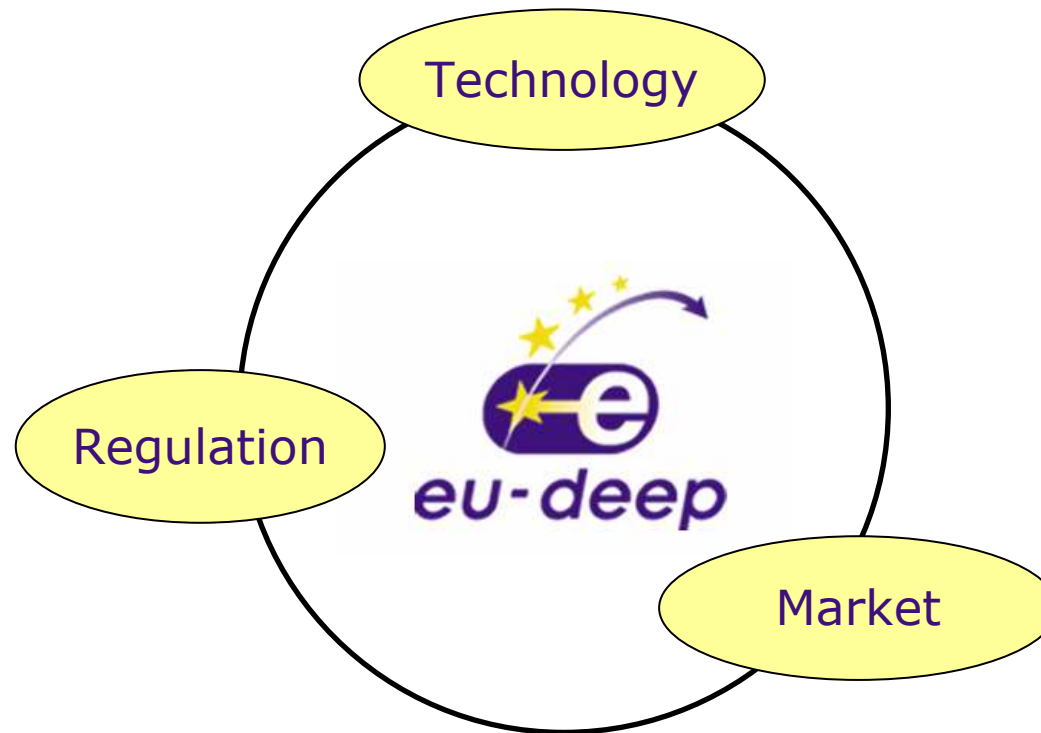
IGU World Gas Conference

Round Table

June 8th 2006

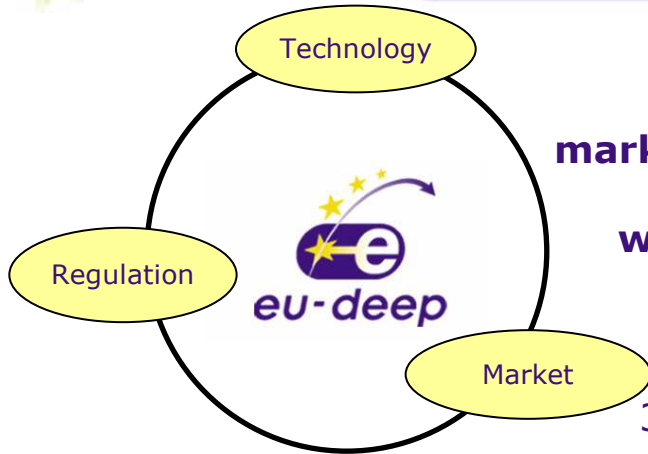
RESEARCH & DEVELOPMENT DIVISION

Main ideas



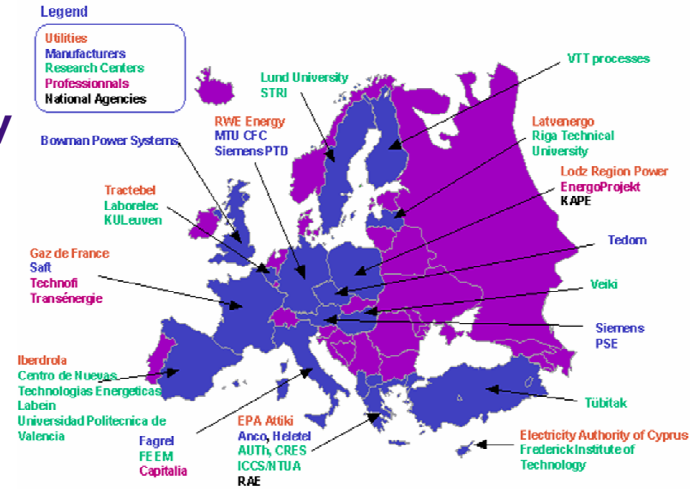
EU-DEEP

The birth of a European Distributed EnERgy Partnership



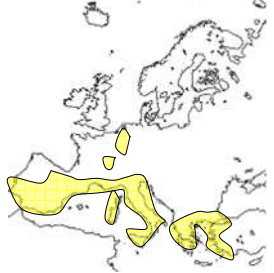
Combines market, technology, regulatory issues into winning business models for DER in Europe

39 partners, 2004 – 2009
29 M€ ( 15M€)

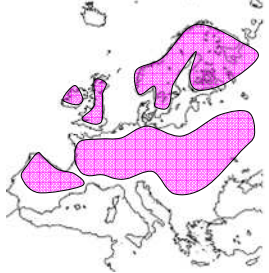


Energy demand and modelling

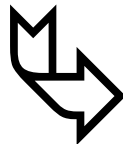
Potential for PV in office buildings in Europe



Potential for CHP in individual houses in Europe

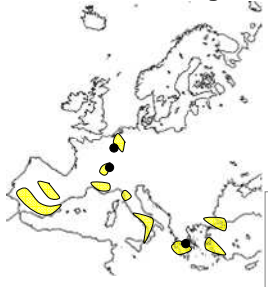


Locate the market potential for DER and detect grid, market and regulation constraints

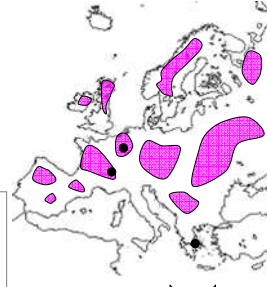


Grid & market integration Technology R&D and validation

Enhanced knowledge of the potential for PV in office buildings



Enhanced knowledge of the potential for CHP in individual houses

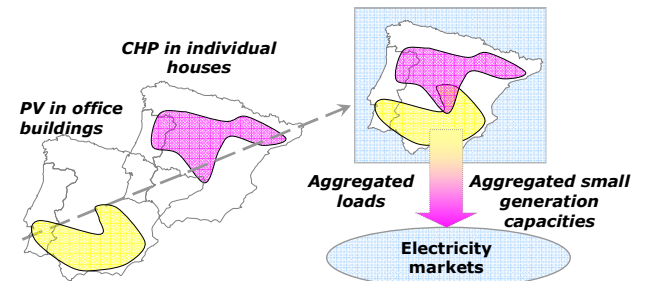


Validate local expansion of DER and combine controllable loads, storage and small generation into new business models

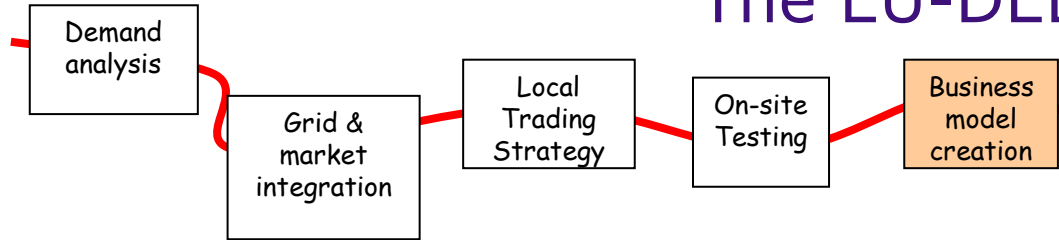


Local trading mechanisms Innovative DER business models

Aggregated potentials of CHP in individual houses and PV in office buildings on a common business model



The EU-DEEP methodology « red ribbon »



An **ESCO** offering two products for the German market integrating a Combined Heat and Power generation

DEMAND SIDE:

Energy efficiency management, which decreases the client energy bill

Electricity is produced or purchased:

- on the market;
- bilateral contracts;
- with existing CHP unit

Required Investissement

Energy management tool

SUPPLY SIDE:

Sales and installation of CHP units

Required investissement

Gas engines
+
Energy management tool

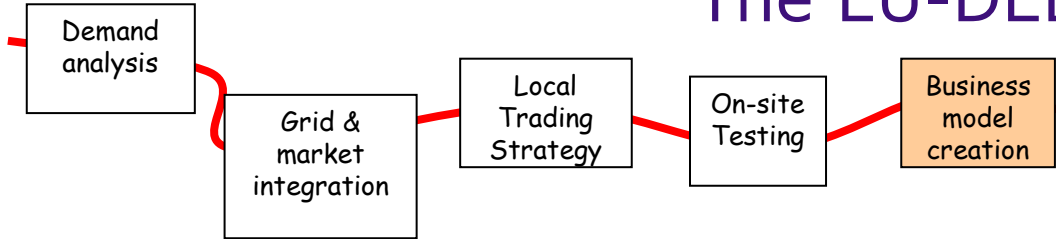
Clients portfolio

Annual Consumption (KWh)	
hotel	1.410.316,31
office	1.290.414,00
university	29.296.363,50
hospital	791.667,00

Hypothesis on revenues

- Free heat
- Sales of electricity to the grid: from 10% to 30% depending on the offer (7c€/kWh)
- Price of electricity to the client : ESCO costs + 11% (sensibility analysis)

TARIFFS	
0,14 €/KWh	HOTEL
0,14 €/KWh	OFFICE
0,12 €/KWh	UNIVERSITY
0,15 €/KWh	HOSPITAL



The EU-DEEP methodology « red ribbon »

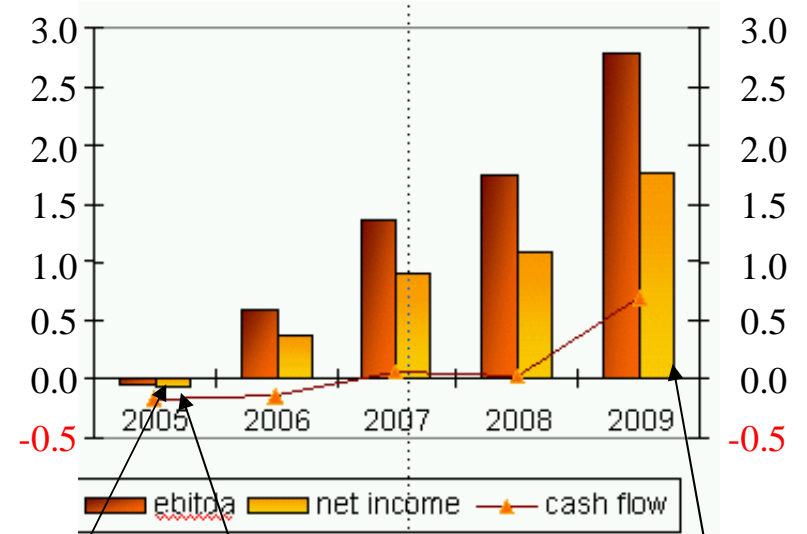
- Equilibrated investissement between business units.
- First business unit starts immediately
- Only a few CHP installations from 2007

“Demand Side” contracts

	2005	2006	2007	2008	2009
hotels	1	3	5	9	15
offices	2	5	10	18	25
universities	0	1	2	2	3
hospitals	0	1	2	3	4
total	3	10	19	32	47

“Supply Side” contracts

	2005	2006	2007	2008	2009
hotels	0	0	0	0	0
offices	0	0	1	2	3
universities	0	0	0	0	0
hospitals	0	0	0	0	0
total	0	0	1	2	3



Negative Cash Flows 2005-2006

Losses in 2005 only

Ebitda increasing throughout BM period

Conclusions

- Freedom: Heat
- Requires high electricity price

Conclusion

**DG is a golden opportunity
for the gas industry
to do more than gas !**