Building another face of Europe 2020 with User Centric SmartGrids
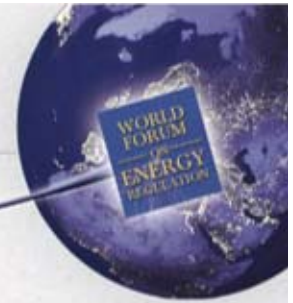
Dr Maher Chebbo

Chairman of ETP SmartGrids « Demand and metering »
Member of the Governing Board of REEEP
VP, Head of EMEA Utilities & Communications industries, SAP

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- ## World Forum on Energy Regulation IV
  ## Athens, Greece

Energy Insight predictions

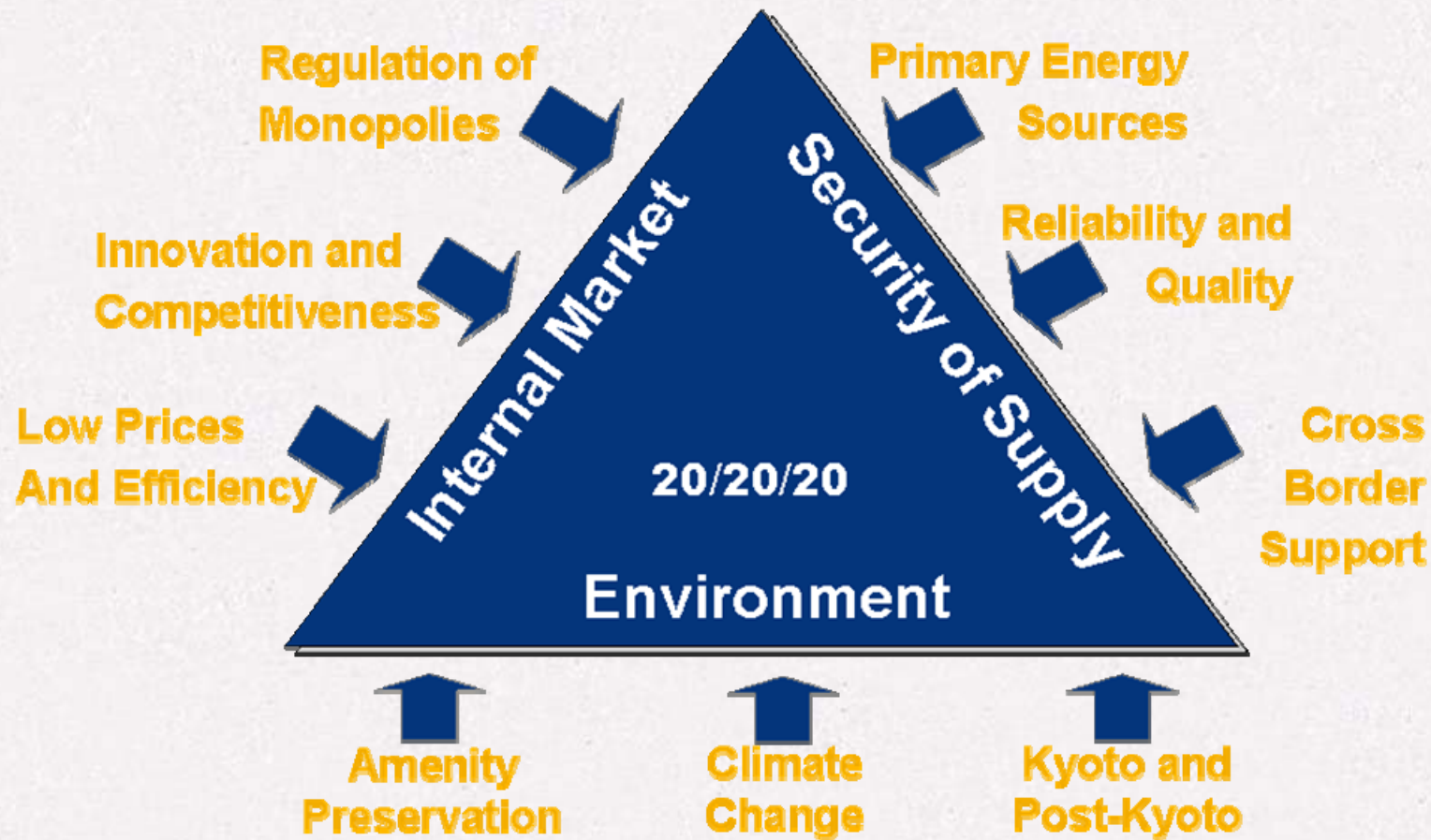Energy efficiency "first fuel" choice

DER as a grid support tool

Intelligent grid up to $70 billion in 2013
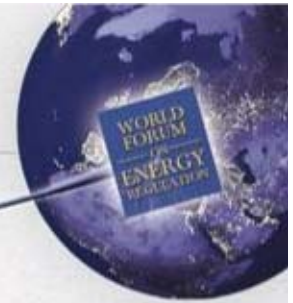
Web portals key for active consumers

Generators focused on CO_2 reduction

SmartGrids targets

Regulation of Monopolies

Primary Energy Sources

Innovation and Competitiveness

Reliability and Quality

Low Prices And Efficiency

Internal Market

Security of Supply

20/20/20

Environment

Cross Border Support

Amenity Preservation

Climate Change

Kyoto and Post-Kyoto

European SmartGrids 20/20/20 in 2020

Empowering end users

Smart Prosumers will consume and produce smarter when offered smarter « automatic » advices in the marketplace

Stakeholders involved

Customer participation aspects

European Union, Governments and Utilities

Consumers acting as Power Suppliers

Suppliers, Consumers, Technology & Service Providers

Retailers to Consumers

Consumers

eEnergy
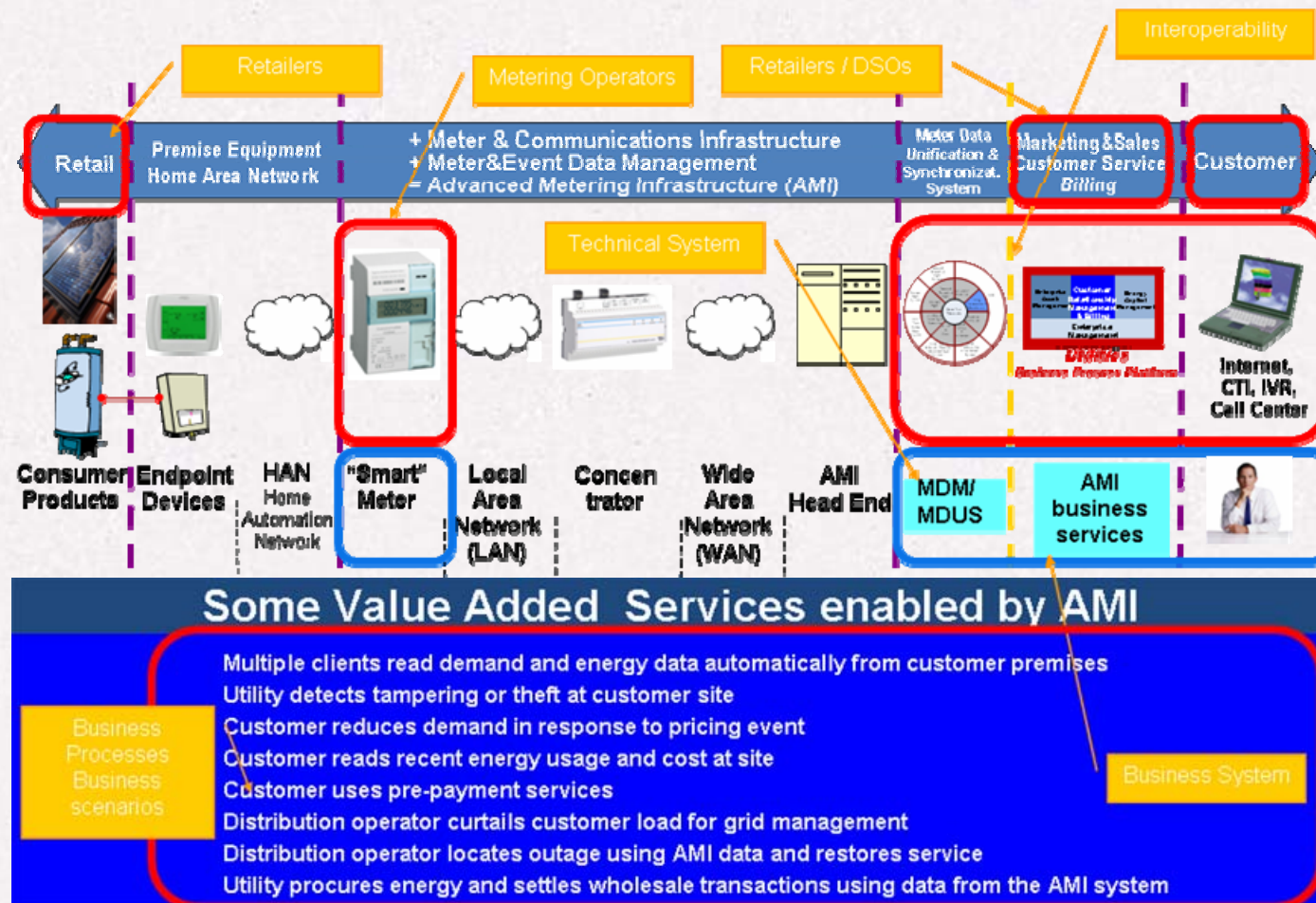(electronic marketplace, DR, virtual …)

Prosumer & active retailing
(bi-directional trade, DR, AMI)

Automatic decision support system
(Intelligent automation, benchmarks, forecasting, DR, AMI)

Better real time prices (price signals)
(Connected devices, DR, ICT, AMI)

Visibility, transparency, customer empowerment, Devices losses, buildings losses, etc
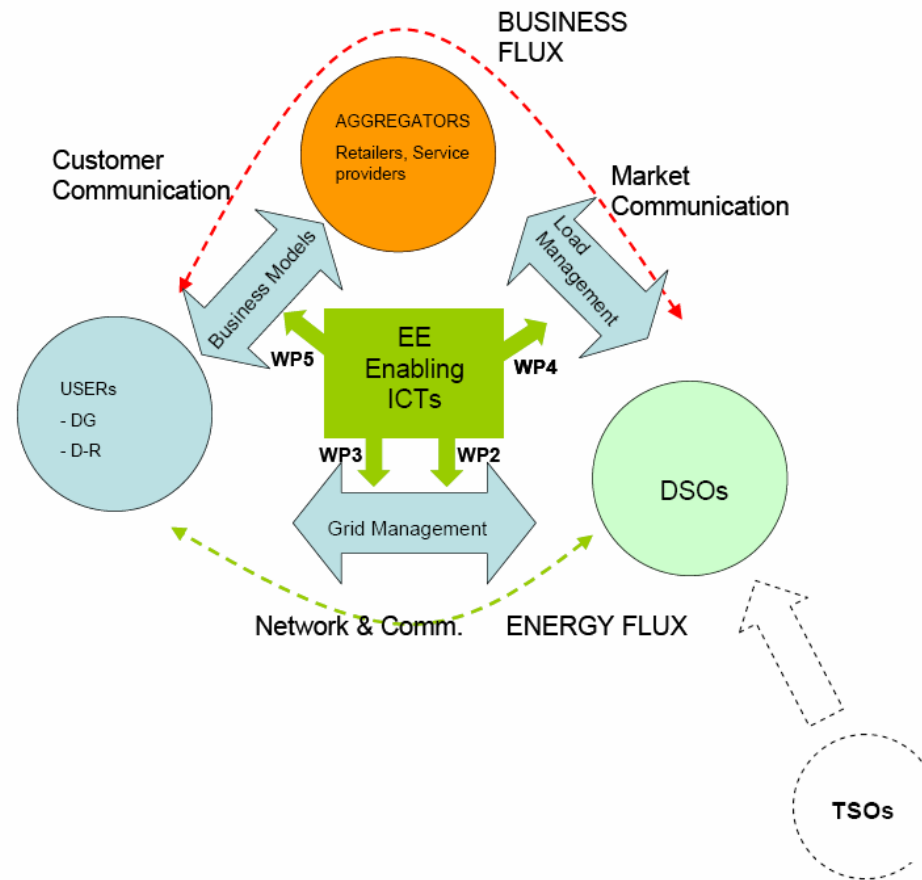(analytical tools, AMR)
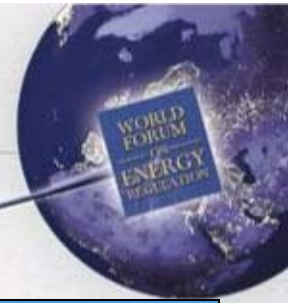
Smart metering processes at the end user

A complex liberalized competitive market
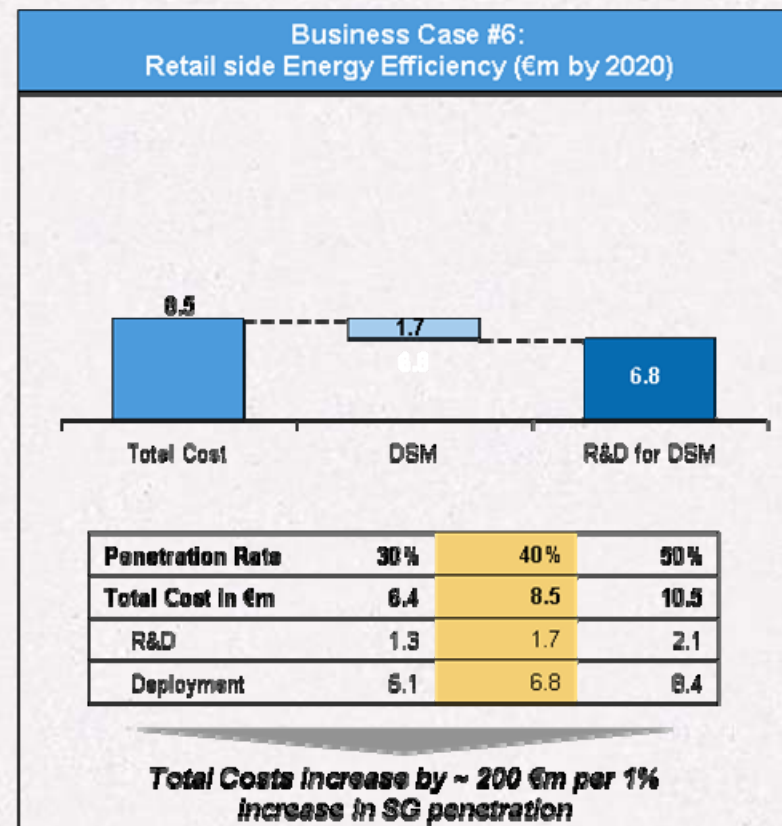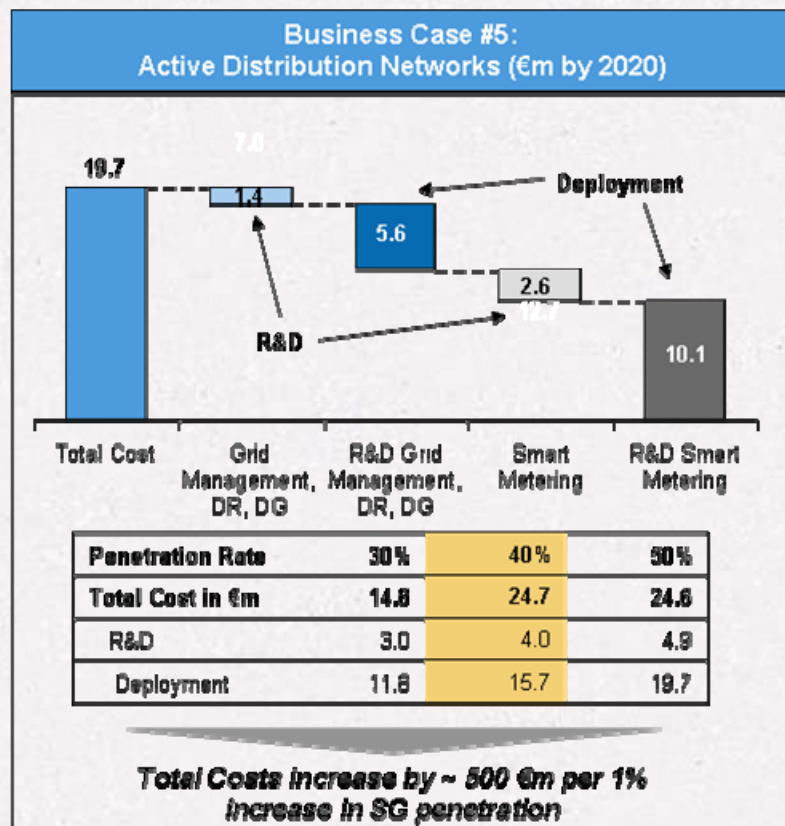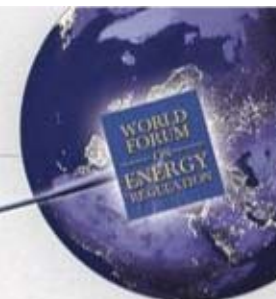

KEY FIGURES and INTERCONNECTIONS

Asking the right questions in SmartGrids deployment

	Business Case #5: Active Distribution Networks	Business Case #6: Retail side Energy Efficiency
Infrastructure Layer	• What structural changes to the physical infrastructure are required? • How can asset value be enhanced through increased monitoring & control?	• To what extent will beyond the meter applications be linked to the physical grid?
Communications Layer	• What requirements drive the digitial grid? • How to deal with the new breadth of information? • How to ensure data integrity and security?	• How will Smart Home devices become linked to the digital ICT layer?
Applications Layer	• How to integrate EV? • How to manage & dispatch DG? • How to institutionalize DR? • How to optimize grid operation?	• How can individual retail customer devices and applications be utilized to achieve large scale energy efficiency improvements?
Other	• How will the interfaces between Transmission, Distribution be impacted • What role will new market participants play? • What regulatory schemes are required in the new set-up	• How Customer Relation and Portal Self Services will become a standard multi-channel interaction ? • How Energy Data Management will become mandatory for forecasting, reconciliation, settlement, balancing and Smart Metering ?

RD&D costs Active DN and Retail in SmartGrids

Business Case #5:
Active Distribution Networks (€m by 2020)

19.7 · 7.0 · 1.4 · 5.6 · Deployment · 2.6 · R&D · 10.1

Total Cost | Grid Management, DR, DG | R&D Grid Management, DR, DG | Smart Metering | R&D Smart Metering

	Grid Management, DR, DG	Smart Metering	R&D Smart Metering
Penetration Rate	30 %	40 %	50 %
Total Cost in €m	14.8	24.7	24.6
R&D	3.0	4.0	4.9
Deployment	11.8	15.7	19.7

Total Costs increase by ~ 500 €m per 1%
increase in SG penetration

Business Case #6:
Retail side Energy Efficiency (€m by 2020)

8.5 · 1.7 · 6.8

Total Cost | DSM | R&D for DSM

	DSM	R&D for DSM
Penetration Rate	30 %	40 %	50 %
Total Cost in €m	6.4	8.5	10.5
R&D	1.3	1.7	2.1
Deployment	5.1	6.8	8.4

Total Costs increase by ~ 200 €m per 1%
increase in SG penetration

Peak demand reduction

Based on $20 M pilot by California utilities, that involved 2,500 customers, over a three year period, gateway systems reduced loads far in excess of dynamic pricing and smart thermostats alone. (**)

Technology	Peak Demand Reduction*
Time of use Pricing Information	8%
Dynamic Pricing Signals	13%
Smart Thermostat	27%
HEMS like device	43%

The Brattle Group "The Power of 5 Percent", The Electricity Journal, October, 2007
*** Source INTEL*

Demand Side Management Benefits

Projects	Topic	Benefits
Finland	Smart metering	7% energy efficiency
Norway (SINTEF)	Demand Response	24.5% energy efficiency
CRE (French regulator)	Smart metering	Reduction of non technical losses by 50% Residential energy efficiency by up to 5% CO_2 reduction by up to 5% (CRE)
DONG Energy	Demand Side Management	25%-50% reduction in Non Delivered Energy 35% reduction in fault search time Up to 90% reduction in Network Reinforcement costs

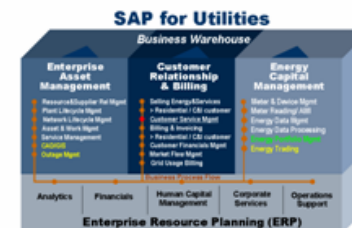# The magic formula

Wise Vision + **Smart Technology** + **Flexible Processes** = **INNOVATION**