These Players that are reinventing energy models in Europe... for which value?

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Transform to the power of digital

Capgemini Consulting

Who we are

Alexandra Bonanni

Manager
Energy & Utilities

alexandra.bonanni@capgemini.com

Paul Faraggi

Senior Consultant
Energy & Utilities

paul.faraggi@capgemini.com

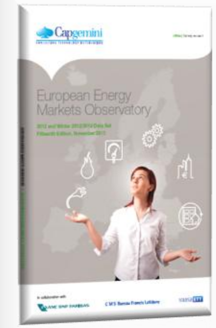
Mathieu Martinez

Consultant
Business & Technology Innovation

mathieu.martinez@capgemini.com

Capgemini: Global Business Partner of Choice for Utilities with unique industry thought leadership

- We provide services to 23 out of Top 25 Utilities*
- We are one of the world's largest business consulting, systems integrators and outsourcers for energy & utility companies, ranked by Gartner based on 2012 revenue:
  - #1 in Utilities for IT Services in Western Europe**
  - #3 in Utilities for IT Services Worldwide**
- IDC positioned us as **a leader for IT services in the EMEA Utilities Market 2013** Vendor Assessment. Our best score in the current capabilities criteria is for our "Range of Capabilities" and "Range of Offering." Within the Future Strategies criteria, we scored very well for our "Portfolio Strategy" and "Customer Service Strategies." ***
- According to a leading market analyst firm, Capgemini is a leader in smart grid and advanced metering infrastructure solutions.



European Energy Markets Observatory

- 16th edition released in October 2014 in cooperation with Natixis, CMS Bureau Francis Lefebvre, VaasaETT
- Visit: www.capgemini.com/eemo

Points of View

- Digital Transformation Benchmark - Emergence of the Digital Utility
- Advanced Distribution Management Systems
- International Market Entry in the Photovoltaic Industry
- Customer centric digital platform for utilities

Capgemini Group: 125,000+ employees, €10.3 bn revenues in 2012
Utilities Sector key figures: 8,900 consultant²s, €729M revenues (7% of group total)

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* Source: Platts' 2012 Top250 energy company rankings
** Source: Gartner, Inc., "Market Share: IT Services, 2012", Kathryn Hale et al, 29 March 2013
*** Source: IDC: "IDC MarketScape: IT Service Providers in the EMEA Utilities Market 2013 Vendor Assessment," Doc #EIOS02V, May 2013.

We initiate a discussion about the new business models and the reality of Utilities business value in Europe

- Informal interviews with our clients / partners
  - New players
  - Equipment providers
  - Incumbent operators
  - ...
- Our Utilities experts
- Our discussions with the Chair of Energy and Environment at Paris Dauphine

We do not claim to have all the answers
but to provide some elements of thought and leads based on our own convictions

How to explain that given such market conditions....

- Overcapacity in a context of decreasing consumption

- Lack of positive signals to the market
  - Barrel of Brent prices drop
  - Tons of carbon / 6 between 2008 and 2013
  - Report of the carbon tax in late 2013 in France

- Energy efficiency
  - ROI proposed too long (5-7 years on average) compared to expectations of contractors (3 years)
  - Substantial gap between announced energy savings and economies recorded / technical difficulties in measuring the energy savings

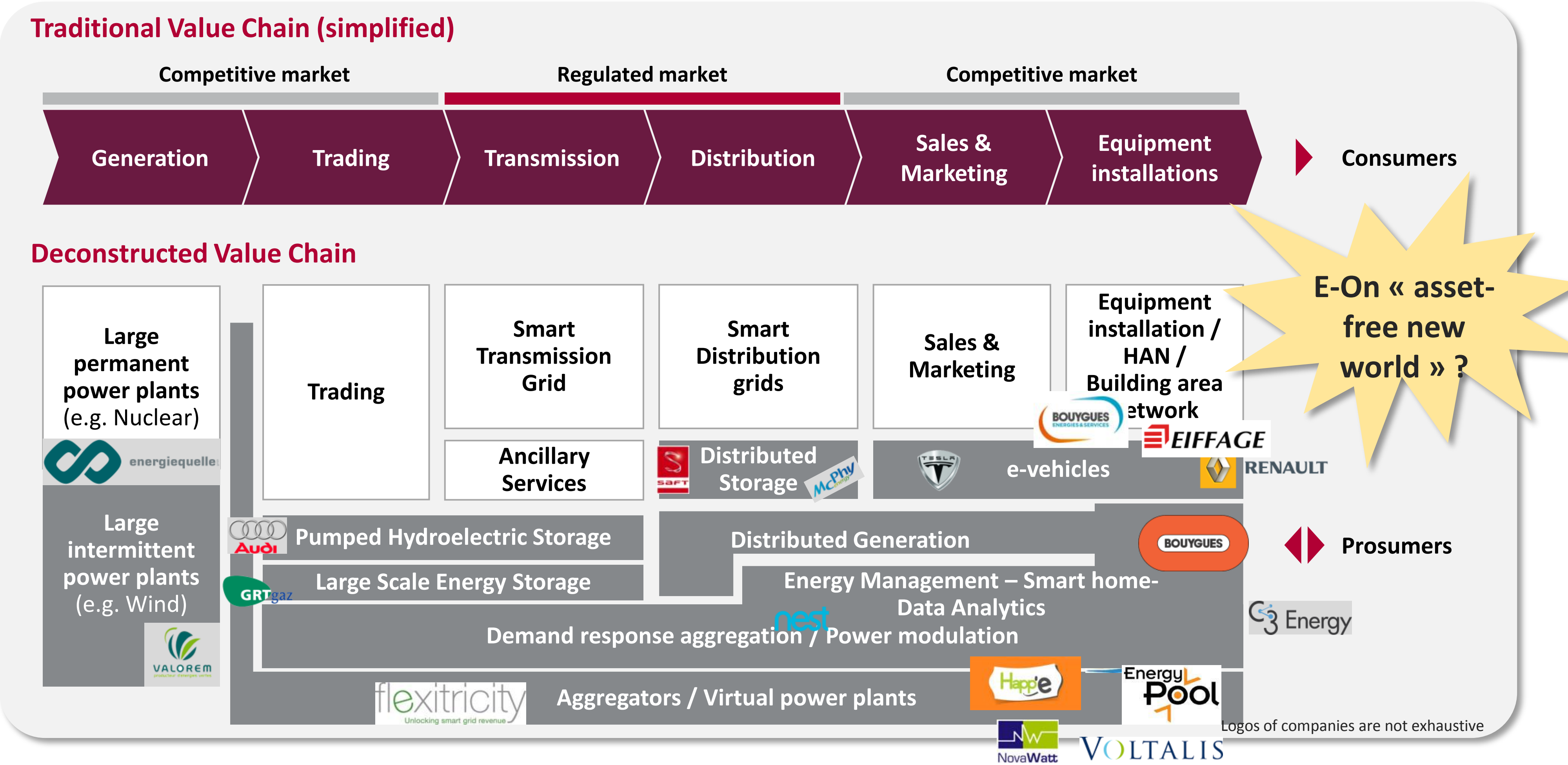
- Regulatory uncertainties
  - Evolutions of tariffs for renewable energy
  - Discrepancies wholesale price vs. retail price
  - Different capacity mechanisms provided in Europe

The change in the energy production structure induces perturbations on all related aspects: technical, economical, political and regulatory spheres do not really know how to behave

Source: Analyse Capgemini Consulting

...a bunch of new players are entering a deconstructed value chain (but for which value ?)

ILLUSTRATION (NON EXHAUSTIVE)



Source: Analyse Capgemini Consulting

The players logics are driven by potential synergies (technological and commercial)

ILLUSTRATION (NON EXHAUSTIVE)

EDF EN : €1,4b (2011)
Neoen : €12,4m (2013)

Green Power (production/ supply)

Equipements providers (battery, exchangers, turbines)

Building / Engineering

Production / Demand response aggregation / Power modulation

Energy Pool - : €7m (2012) emerged as a pure player

Meter manufacturing

Grid optimisation

Energy management

DG dispatching

Schneider Electric took a participation in Energy Pool

Integration

DG unit manufacturing

MDM⁴

DG unit operation

- **Green Power** producers-suppliers benefiting from a (temporary?) profitability
- Telecommunications operators targeting a potential increase of revenue through the generalisation of the **Machine-To-Machine**
- The actors of information technology anticipating their key role through **data flows to manage**
- Incumbents electrical equipment providers wish to enrich their offerings by **providing the service**
- Some actors positioning over the **entire value chain** with an image of energy efficiency player (eg. Schneider Electric through acquisitions)

Bouygues Telecom made a partnership with Ijenko

HAN⁵

Last mile communication / FAN

WAN²

LAN3

1. Infrastructure and software; 2. World area network; 3. Local area network; 4. Meter data management; 5. Home area network

Source: GTM research-Capgemini analysis

● Capacity to act as per operator (vs. mainly provider)

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A driving factor: the layers of the Smart grid chain

Regular grid component — Smart grid component

Utilities | Infrastructure | Prosumers

Chaîne de valeur pour l'électricité: Production ▸ Transmission ▸ Distribution ▸ Final consumer ◂▸ Distributed generation & storage

Layer	Regular grid component	Smart grid component	Regular grid component	Smart grid component
1 Network equipment	Transmission lines Substations / transformers	Equipments sensors Super conductors FACTs HT wires & systems	Distribution lines Substations / transformers Traditional meter	Automated feeder / switch Smart distribution substation Smart meter / AMI Energy storage
2 Communicating layer	Radio Frequency Network (old) / Optical fibres (new)	Wide Area Network (WAN) New Cable /wireless connections	Power Line Communication Medium voltage remote monitoring infrastructure Data collection (isolated meter) infrastructures	Field Area Network (FAN) Automated data collection infrastructure Home Area Network (HAN) Mobility tool
3 Appliances & software	Dispatching management Piloting & control (dispatching safety)	Distributed control system GIS (Geographic Information System) Virtual Power Plant		Distribution management system Data acquisition and storage Monitoring & management Renewables management In-home displays Energy management systems Demand management GIS (Geographic Information System) Advanced power monitoring

Source: Market research & CC analysis

The value reality of new business models is highly questionable… Remember the early 2000s

Refocusing /acquisitions

A vast movement / attraction for diversification and global offers

- Context:
  - **Deregulation**
  - A **technological opportunity**: Power Line Communication
  - A "**dematerialised**" player (Enron (!))
  - Telco convergence : "the **Box**"
  - GE experiment : control of the **industrial assets information** chain
- New offers
  - BtB :Outsourcing offers for industrial core processes (**multifluids offers**, energy management)
  - BtC : integration of services =>"**multitutilities**" in UK

Horizontal integration / multi-utilities

Followed by « Back to economic fundamentals»

- Business refocusing
  - Long Tem Debt / ROCE → no sustainability of diversification for medium size actors (eg. UK RECs)
  - "Go to Market" issues
    - Multiplicity of offers that were difficult to value
    - Difficulty to leverage mass market with various specific offers
    - Ineffective commercial synergies

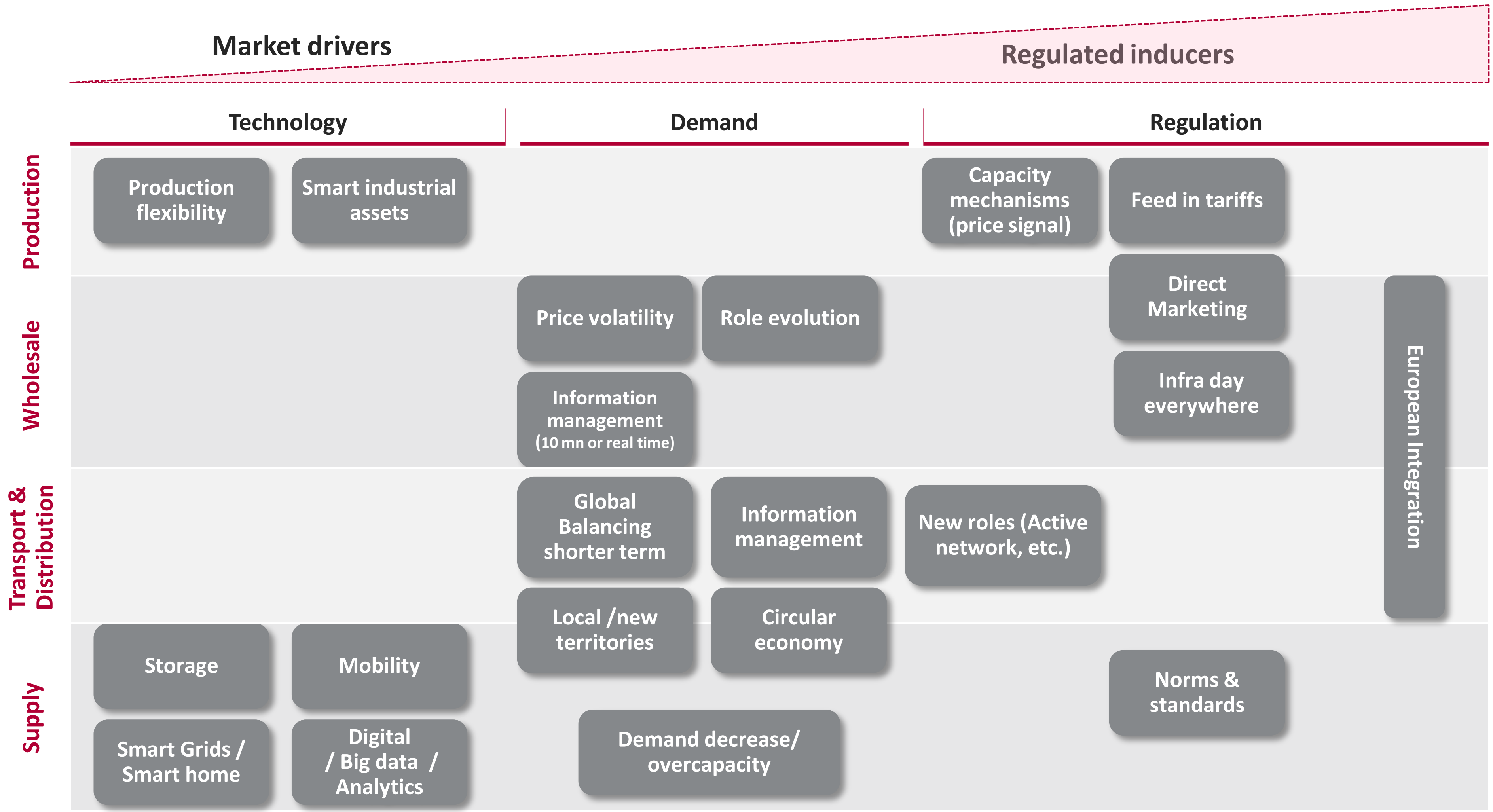
Lessons learnt

- Need for market positioning consistency
  - Product/ market adequacy: strategic segmentation, rationalisation of offers
  - Value chain positioning → critical size (with which assets?)
- Thinking technology in terms of ROI → potential technological opportunities are not a sufficient condition for short term strategic business choices

Consistency of market positioning

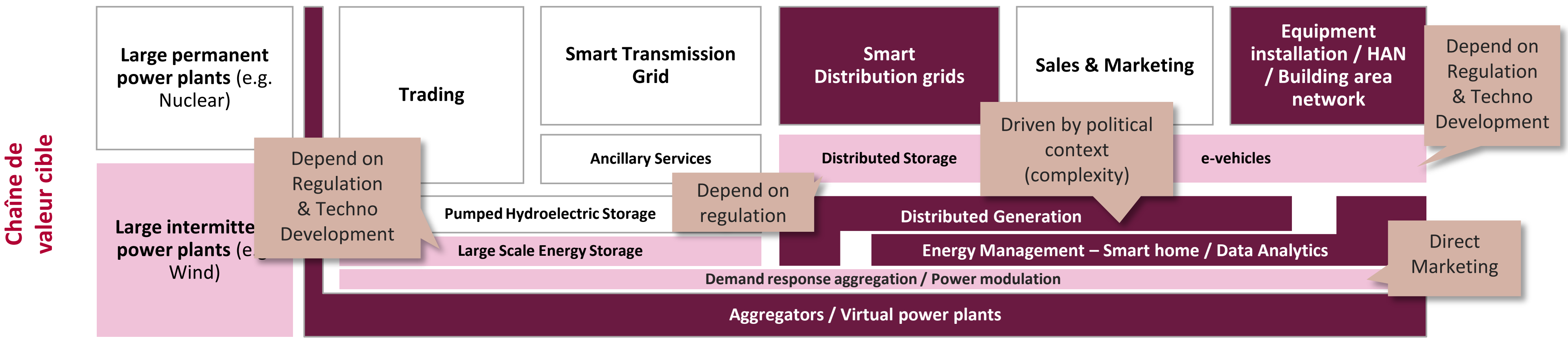
What is the robustness of the new models?
What is their sustainability?

We identified business models drivers that are either market drivers (firm) or regulated inducers (evolutionary, risky)



So where is the value?
Value for new entrants mostly stands into 2 activities: **local level integration** and **data analytics**

Value
+
?



Drivers	▪ Capacity remuneration ▪ Flexible means of production ▪ Smart Grids for large intermitent plants	▪ Volatility of wholesale prices ▪ Infra-day everywhere ▪ European Integration	▪ Network reconfiguration ▪ Global Balancing shorter term	▪ Data management ▪ New roles (Active network, etc.)	▪ Demand decrease ▪ Data management (volumes, consumation information hubs)	▪ Norms & standard ▪ IoT / Web 3.0 ▪ New territories
Threats	▪ **« Capexisation »** ▪ **Feed-in tariff decrease**	▪ **Financial losses on the more volatile markets + complexity (capacity)**	▪ **Network as a scarce resource (versus public opposition)**	▪ **End of concession agreement**	▪ **Low costs business models (need for performance levers including digital transformation)**	▪ **High competition (new entrants on the decision making process, capture value)** ▪ **Complex governance for new territories**
Opportunities	▪ **Coexistence of central and local models** ▪ **Production aggregation**	▪ **Greater integration upstream / downstream**	▪ **Storage development as a new source of active / regulated revenue**	▪ **Profit from new businesses (smart, etc.)** ▪ **Integrated local level models (microgrids, eco efficiency…) → global solution**	▪ **Profit from new businesses (demand-side management energy efficiency)**	▪ **Services MtoM / Big Data**

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We are exploring 5 leads

1 The existing energy model experiences a revolution, with difficulties for the stakeholders to adapt

- A back « to economic fundamentals » could affect the large intermittent power plant (renewable are exposed to subventions drop)
- Key questions are critical size and financial robustness

2 There is a room for value on the wholesale market (low investment)

- Production aggregation
- Demand response aggregation / Power modulation operation

3 Central and local energy systems can and will coexist

- Energy independency, perequation persistence, EU regulation harmonisation foster a central system
- Dynamics raising from the local level though generated distribution → At stake , integrated solution (heating systems, green and grey energies....) with a proper governance (coordination of a complex eco system)

4 Digital appears as both a growth and performance lever

- Digital as the key factor of Utilities transformation (internal performance & efficiency)
- Digital causes downstream perturbations: new comers disintermediate asset owners and operators
- Value is to be captured in Analytics performance

5 The downstream revolution is related to the upstream evolution

- Capexisation with new techs that reinforce the value chain interdependencies and integration
- Distributed generation