

Chaire European  
Electricity Markets  
(CEEM) et Chaire Energie  
& Finance d'HEC

## Towards the Separation of Ownership and Operations: Risks Allocation for the New Scenario and the Emergence of the Integrated Energy Service Companies

Paris, November 24<sup>th</sup>, 2014

## 1. HES at a glance

## 2. What is changing in EU Power Sector

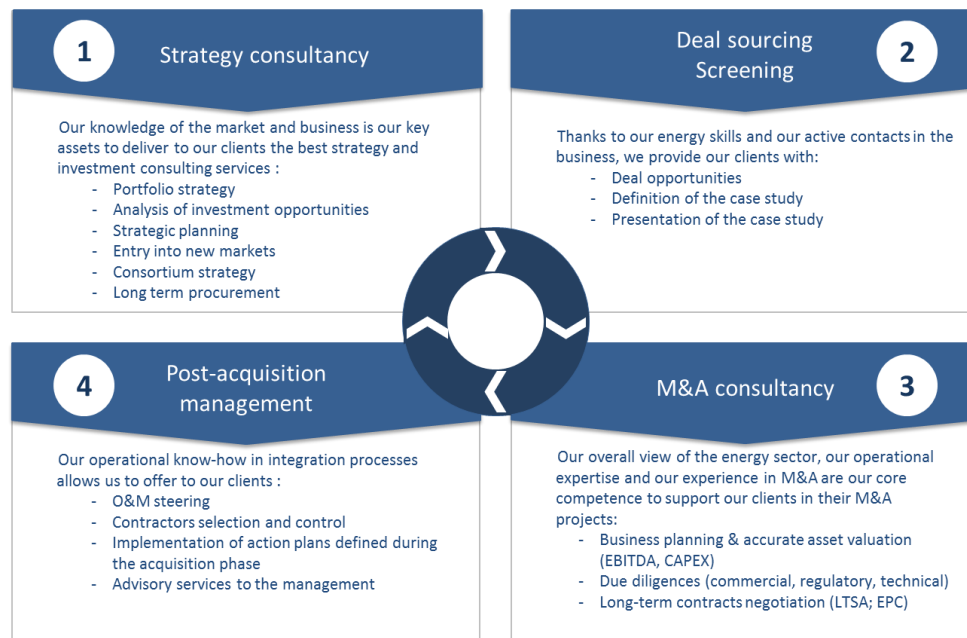
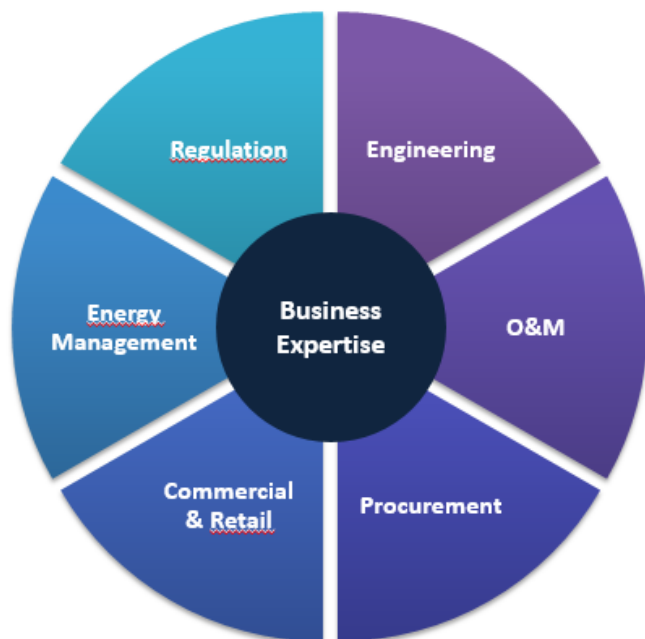
1. Concentration and later disposal
2. Network Disposal
3. Outsiders taking over distressed assets

## 3. Risk map for a new arrangement

1. Natural responsibilities allocation for Power generation
2. Limits to this new arrangement

## 4. What will change in EU Power? Moving towards an investment crisis

# 1. HES consultancy based on a deep knowledge of business, market and operational management



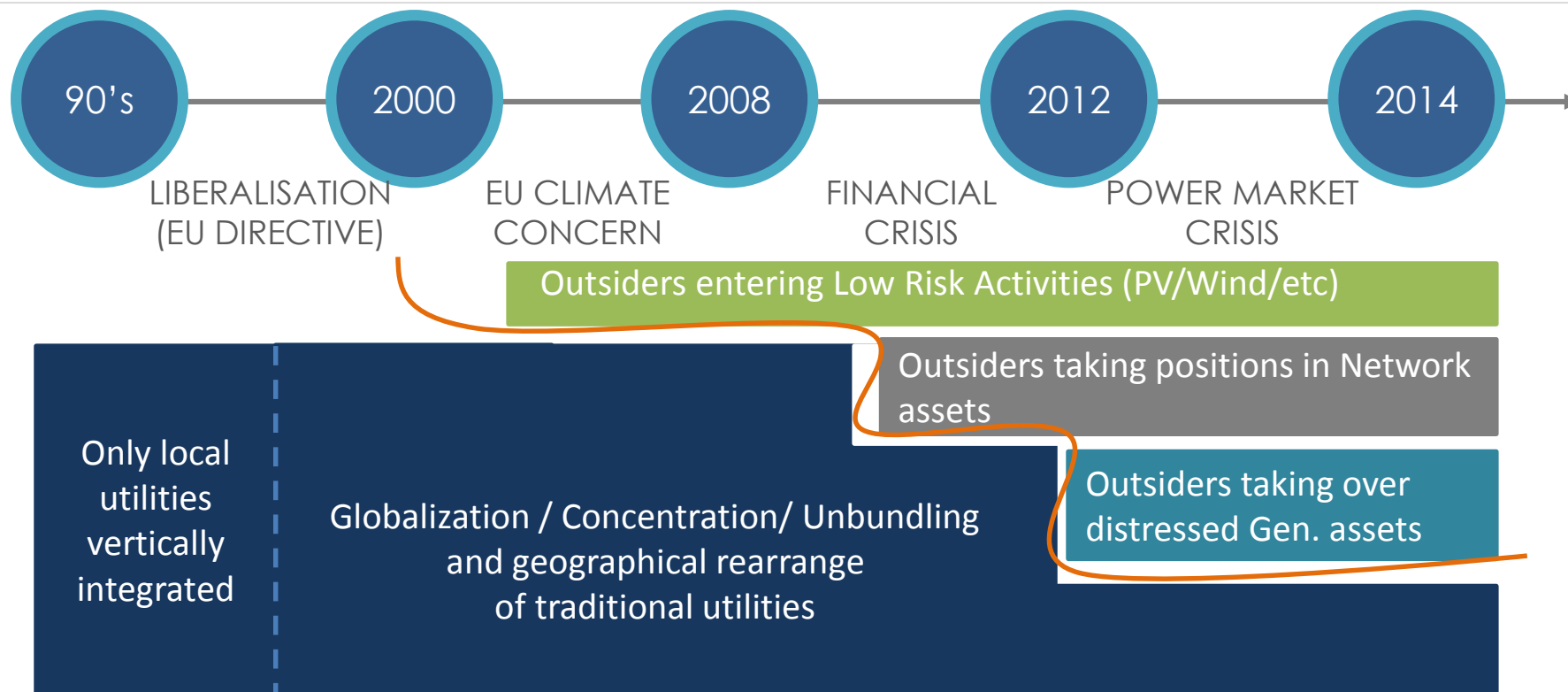
A comprehensive and operational business expertise in energy activities

Haya Energy Solutions is a **European consultancy** firm that combines **M&A expertise and knowledge of the energy sector**. We provide investors with a key approach of the business and market; we find the best opportunities for each client.

Haya Energy Solutions provides the client with the whole knowledge about energy assets and related opportunities, and also supports the client on each step of an acquisition. Once the acquisition is achieved, HES helps the clients to take over targets. Further more, some clients ask HES to monitor the company during normal operation.

All of HES experts are former senior executives - we have worked for the most important electricity and gas utilities, with high operational responsibilities.

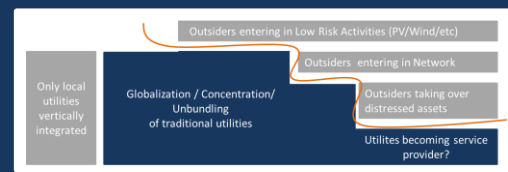
## 2. What is changing in EU Power Sector



Taking advantage of the EU liberalization of gas and power markets, traditional utilities moved from a local vertical integrated position to a pan-European one. From the 90's up to 2008, major utilities absorbed local companies to create large conglomerates. In the early years of the new century, climate concern in the EU promotes CO2 control mechanisms (EUAs; CERs) at a time when renewable generation (wind and PV) is highly subsidized all over Europe. New entrants take control of power generation attracted by secured revenues (without any price risk) and proven technologies easy to manage (PV). Subprime crisis in 2008, transformed into a credit crisis, convinced utilities to sell regulated business to third parties. Eventually, demand reduction, extinction of free allocations of EUAs and the impact on prices of renewables, caused a complete crisis in EU power generation. Major utilities decided to dispose of up to 24 GW of thermal capacity, either definitively shutting down or mothballing some of it. Recently, new entrants are taking over some of these distressed assets.

## 2. What is changing in EU Power Sector

### Concentration and later disposal



#### Other divestments:

- UK power distribution (2011)
- Rödsand II (2013)
- E.ON Mitte (2013)
- Lithuanian energy companies (2014)
- Buschhaus coal-fired power plant (2014)
- Power Output Capacity To Morgan Stanley Unit
- 3.5 percent stake in OAO Gazprom

ENDESA FRANCE

ENDESA ITALIA, VIESGO (2007)

MOL FOLDGAZELLATO ET AL. (2006)

PRAZKA PLYNARENSKA ET AL. (2006)

HOLFORD GAS STORAGE (2005), ENFIELD (2005)

MIDLANDS ELECTRICITY (2004), POWER DISTRIBUTION UTILITIES IN NORTH-EASTERN BULGARIA (2004), DISTRGAZ NORD (2004)

RUHRGAS (2003)

FORTUM KRAFTWERK BURGHAUSEN ET AL. (2003), JHOMORAVSKA ENERGETIKA (2003), GRANINGE (2003)

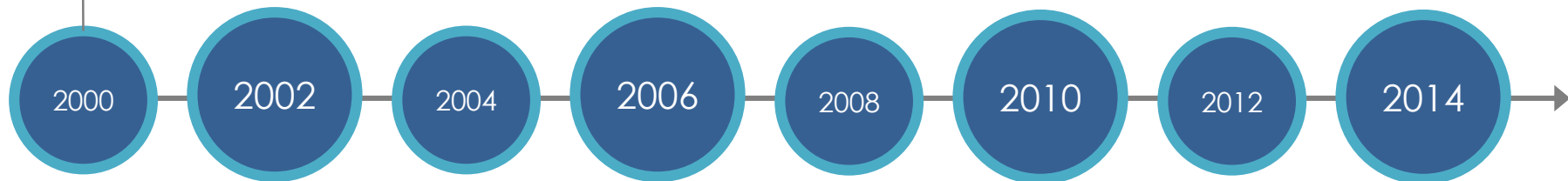
TXU UK (2002), THÜGA (2002), ESZAK-DUNANTYLI (2002), FORTUM ENERGIE (2002), ZAPADOSLOVENSKE ENERGETICKE ZAVODY (2002), ESPOON SAHKO (2002)

HAFSLUND (2001), HWE ET AL. (2001), HEIN GAS (2001), POWERGEN (2001), SYDKRAFT (2001)

Macquarie in exclusivity for E.on Spain (Viesgo)

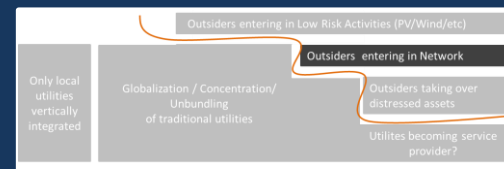
Some private equity funds in the race for E.On Italy

E.ON was founded in June 2000 by the merger of VEBA and VIAG



## 2. What is changing in EU Power

### Network Disposal



#### Grid integration

PreussenElektra  
+  
Bayenwerk

EON Netz  
(Transpower)

Sold to

Tennet

RWE  
+  
VEW

RWE Netz  
(Amprion)

Sold to

Commerz Real AG  
(Infrastructure Funds)

HEW  
+  
VEAG  
+  
BEWAG  
+  
LAUBAG

Vattenfall Europe  
Transmission (50 Hertz)

Sold to

Elia  
+  
IFM  
(Australian  
industry pension  
funds)

EnBW → EnBW Transportnetze

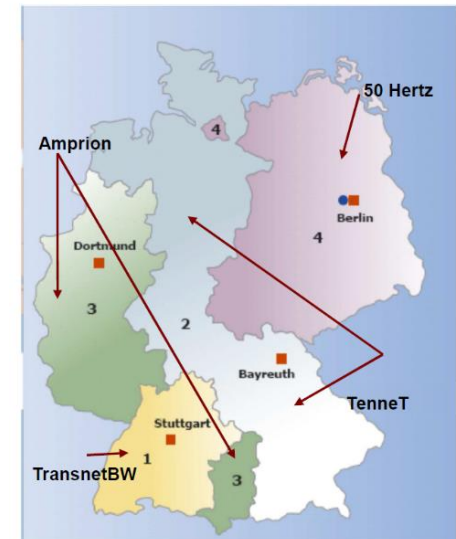


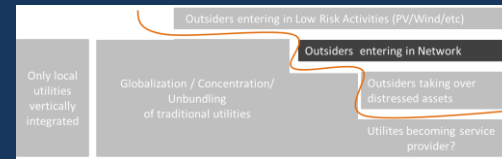
Figure 5: the four TSOs in Germany.

#### Other Network divestments:

- 2012 Enel sold Terna to Cassa di Risparmio di Bologna S.p.A
- 2010 Endesa sold gas distribution network to Goldman Sachs funds
- ...

# 2. What is changing in EU Power

## Outsiders taking over distressed assets



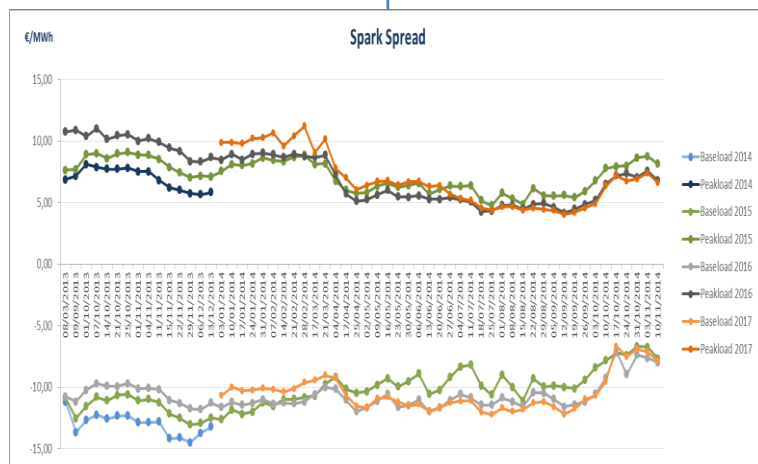
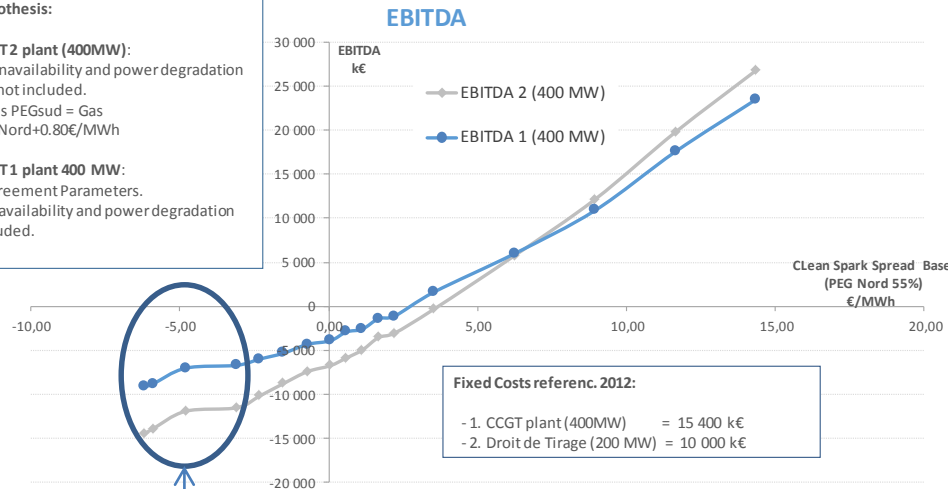
**Hypothesis:**

**CCGT2 plant (400MW):**

- Unavailability and power degradation are not included.
- Gas PEGsud = Gas PEGNord+0.80€/MWh

**CCGT1 plant 400 MW:**

- Agreement Parameters.
- Unavailability and power degradation included.



ContourGlobal	Macquarie Group	LLC
Spain 2011 CCGT Power 2 x 400 MW Gas Natural Fenosa	UK 2013 CCGT Power 832 MW DONG Energy's Severn	Spain 2014 CCGT Power 755 MW ESB & Osaka Gas UK Ltd
EPH	BP Global Investments	KKR
UK 2014 Coal Power Power 2000 MW Eggborough	Spain 2014 CCGT Power 785 MW Iberdrola	France 2014 CCGT Power 2 x 400 MW Verbund

Under current market conditions, CCGTs are not able to cover fixed costs (negative EBITDA). Following OTC market indicators, spark spread will stay at levels under positive EBITDA for a while.

Utilities like E.On, RWE, Statkraft, GdF, Iberdrola, Enel, Vattenfall, etc. have decide to mothball or to retire up to 24 GW of thermal capacity all over Continental Europe.





























Despite the

, and during the last two years, some equity funds have decide to acquire some assets in a compromised situation.

Utility owners of thermal plants are likely to continue to sell these to third parties in the coming years. **Purchasers take the risk of these distressed assets by paying a price far below replacement costs.** 7

# 3. Risk map for a new arrangement

## Natural responsibilities allocation for power generation

	Risk	Description	Insider	Outsider	Mitigation for Outsider
BUSINESS RISK	Development	Difficulty to obtain construction and operation permits	 		<ul style="list-style-type: none"> <li>▪ Buying licenses</li> <li>▪ “ ” Existing plants</li> </ul>
	Construction/ Building	Increased construction costs Increased delay in construction Lack of performance of the plant	 	 	<ul style="list-style-type: none"> <li>▪ Turn-key schema</li> <li>▪ Buying Existing plants</li> <li>▪ Proven technologies</li> <li>▪ insurances</li> </ul>
	Operation	O&M costs increase Lost of performance Unavailability	  	 	<ul style="list-style-type: none"> <li>▪ Proven technologies</li> <li>▪ Outsourcing of O&amp;M</li> <li>▪ insurances</li> </ul>
	Market (price & volume risk)	Risks related to market prices volatility. Volumes sold and margins differ from forecasts.	 	  	<ul style="list-style-type: none"> <li>▪ PPA</li> <li>▪ Hedges in OTC Markets (not liquid in the L/T)</li> </ul>
EXTERNAL	Regulation	Regulatory changes which affect economic conditions of plants		 	<ul style="list-style-type: none"> <li>▪ Choosing the right country</li> </ul>
	Environment	Changes in environment protection conditions		 	<ul style="list-style-type: none"> <li>▪ Right country</li> <li>▪ Right technology</li> </ul>
	Financial	Interest rates evolution, access to funding	 	  	<ul style="list-style-type: none"> <li>▪ L/T financing (fixed)</li> <li>▪ Equity investment</li> </ul>



# 3. Risk map for a new arrangement

## Limits to this new arrangement

	Risk	Description	Insider	Outsider	Mitigation for Outsider
BUSINESS RISK	Development	Difficulty to obtain construction and operation permits	😊😊	😞	<ul style="list-style-type: none"> <li>Buying licenses</li> <li>Existing plants</li> </ul>
	Construction/ Building	Increased construction costs Increased delay in construction Lack of performance of the plant	😊😊	😞😞	<ul style="list-style-type: none"> <li>Turn-key schema</li> <li>Buying Existing plants</li> <li>Proven technologies</li> <li>Insurances</li> </ul>
	Operation	O&M costs increase Lost of performance Unavailability	😊😊😊	😞😞	<ul style="list-style-type: none"> <li>Proven technologies</li> <li>Outsourcing of O&amp;M</li> <li>Insurances</li> </ul>
	Market (price & volume risk)	Risks related to market prices volatility. Volumes sold and margins differ from forecasts.	😞😞	😞😞😞	<ul style="list-style-type: none"> <li>PPA</li> <li>Hedges in OTC Markets (not liquid in the L/T)</li> </ul>
EXTERNAL	Regulation	Regulatory changes which affect economic conditions of plants	😊	😊😊	<ul style="list-style-type: none"> <li>Choosing the right country</li> </ul>
	Environment	Changes in environment protection conditions	😞	😞😞	<ul style="list-style-type: none"> <li>Right country</li> <li>Right technology</li> </ul>
	Financial	Interest rates evolution, access to funding	😞😞	😊😊😊	<ul style="list-style-type: none"> <li>L/T financing (fixed)</li> <li>Equity investment</li> </ul>

- Outsiders are taking its natural position providing access to funds while Utilities provide business knowledge.
  - Outsiders become owners of the assets** (even sharing ownership with former owners).
  - Utilities become service providers** (engineering, maintenance, operation, energy management, etc.)
- The new arrangement makes it necessary to implement complex interactions between owner and operator/service provider.
  - Especially, **services impacting on future assets value are not easy to manage.**
  - At present, the **former owner is reluctant to keep any liability on market risk.**

- Regulatory risk is not easy to be managed by the parties** . For the last years regulation evolution has shown instabilities which drive away investors. Discussions on carbon emission limits, renewable thresholds, nuclear limitations, etc. make investments in power generation undesirable.
- Market risk is no longer desirable.** It is not possible to cover price and volume risks beyond market liquidity. Price signals are not clear enough to decide on investments in electricity generation. It is important to note that current transactions on merchant assets are based on values below reposition investment costs. No new merchant investments will be done under the current situation.
- Others limits to the model
  - Investors are not ready to support technological risks. Technologies of unproven performance will not be supported by outsiders (except in the case of a subsidized scheme)
  - Unsolved risks. Investors will not be ready to take risks like nuclear plants dismantling or nuclear waste treatment. Only well-known risks are accepted by outsiders

# 4. What will change in EU Power generation? Moving towards an investment crisis

## 1. Investment crisis

During the last years we have watched the degradation of the financial situation of traditional utilities due to the various reasons mentioned earlier: impact of subsidized renewables on market prices; demand reduction due to the crisis and better energy efficiency; reduction of carbon prices; etc. Current discussions being held in most EU countries on the development of renewable sources make us believe that market price signals will be even more erratic in the coming years.

For the time being, the System requires no additional capacity (except in some countries, such as France). But, as Entso-e explains in its 'Outlook Scenario and Adequacy Forecast 2014-2030' 'under a conservative scenario, 47GW of Reliable Available Capacity are required to reach today's level of adequacy, while this figure will exceed 100GW by 2025'.

Let's not be mistaken – the divestments in power generation which we have described show that there are some outsiders willing to take some risk. However, these outsiders would never take the risk of building any new capacity under current market conditions.

From our point of view, we will be watching an investment crisis as soon as the need to add new capacity to the system arises.

## 2. New measures

CRM (Capacity Remuneration Mechanism). Signals provided by these retribution schemes could be enough to maintain operations of available plants or to reactivate plants in a mothballing situation. Based on this signal, we do not believe investors would risk making new investments.

Auctions for new capacity. If private investors or utilities do not cover capacity needs, the auction system will incentivize new investments. If those mechanism are implemented, we can guess existing capacity owners will claim for similar conditions to those obtained by auctioned capacity ones.

CfD (Contract for Differences). This is just a camouflaged feed-in tariff.

## 3. Back to the future (or forwards to the past)

The new measures (CRM; Auctions; CfD; etc.) are just a temporary arrangement for a market which does not work. The more external measures are introduced in the market, the worse it will work.

From our point of view, we are heading towards a new re-regulation of power generation, where investment decisions are taken by States Energy Planning bodies and where operators will execute these decisions. Business risks (development, building, operation) will be allocated to operators who will not bear market risks. Under this environment, outsiders (funds) will be ready to invest and the System would reach the necessary reliable capacity (with a suitable mix in generation). Bets are welcome!!

## Contact:

**Lourdes GRANADOS**  
**[l.granados@hayaenergy.com](mailto:l.granados@hayaenergy.com)**

Tel. +33 1 30 15 78 83  
5, Rue du Chant des Oiseaux  
78360 Montesson (France)

**[www.hayaenergy.com](http://www.hayaenergy.com)**

# Back-up

## ENTSO-E : OUTLOOK SCENARIO AND ADEQUACY FORECAST 2014-2030

Reliable Available Capacity (RAC = NGC – UC, where UC means unavailable capacity and consists of non-usable capacity, maintenance & overhauls, outages and reserves). Under the best case scenario (Scenario B), RAC increases at both reference points over the period 2016 - 2025. The RAC in January is higher than in July, as it is required to cover load, and due to lower amounts of planned maintenance & overhauls.

The Remaining Capacity (RC = RAC - load) decreases slightly over the period running from 2015 to 2025. Remaining Capacity is higher than the Adequacy Reference Margin (ARM) during the entire period until 2025 at both reference points, and generation adequacy is thus met in most of the situations at an ENTSO-E system level (not considering capacity limitations between countries and/or regions). The level of adequacy (characterized by the difference between the RC and the ARM) decreases considerably during the assessed period at both reference points.

The average share of RAC in the total ENTSO-E NGC in 2020 is expected to be about 59% in January (55% in July), with a further decrease to 56% (January) and 52% (July) in 2025. The available capacity is expected to grow at a slower pace than the generation capacity due to an increased share of intermittent energy sources in the generation mix. Unavailable capacity thus occupies an increasingly larger share of NGC. Furthermore, due to the highly expected penetration of variable generation into the energy mix, complementary measures such as the ones described in the ENTSO-E network codes become even more urgently needed to ensure the balancing of the system in the most efficient manner for the consumer.

Under a conservative Scenario A, RAC decreases from 637 GW in 2014 to 618 GW in 2020, and to 584 GW in 2025 (for January 7 p.m.). Without additional units commissioned, generation adequacy is expected to be met beyond 2016, while in 2020 the level of adequacy becomes slightly negative and further declines until 2025.

Additional generation units seem to be necessary in Europe to have a sufficient level of margin. In 2020, 47 GW of additional RAC (beyond already confirmed investments) will be required to reach today's level of adequacy, while this figure will exceed 100 GW by 2025. Depending on the penetration of variable generation in the overall energy mix, this could imply that the level of required investment in terms of installed capacity will be significantly higher.

Under the best case Scenario B, adequacy levels remain in the positive range, however, with steadily decreasing margins at the beginning of the next decade.

