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## **Transformation Plan** for Energy Transition

**Didier HOLLEAUX, Executive Vice President** 





### A global and diversified footprint\*





### An organization close to customers and territories



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ENGIE

**ID card** 





### An energy revolution is ongoing

The new energy world is characterized by **decarbonization**, **decentralization** and **digitalization** (the 3 "D").





## A strategy in line with our environnement's evolution



# **Transformation plan**

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## **Re-shaping the portfolio**





#### Target G€15 reduction in net debt

**15** reduction in net debt **Target G€** 

Target G€22 in investments, including G€14<sup>(2)</sup> in growth<sup>(3)</sup>



(1) BtoT or "Business to Territories": offers dedicated to authorities and investors in city and land planning and construction

(2) Including G€1 in investments in innovation and digital

(3) Net of DBSO and excluding E&P

#### Non recourse project finance used when available for major asset investment.

- All other financing is done and managed centraly (except when prohibited by tax or regulation).
- Allows ENGIE to optimize the cost of financing and the use of green bonds.



### Low CO<sub>2</sub> power generation (1/2)



#### Installed ENGIE capacity by energy source\*

- 112.7 GW of total installed power-production capacity
- Renewable energy : more than 20% of Group's generation capacity



### High $CO_2$ capacity has been reduced to less than 10% in 2017.

\* Including 100% of capacity of assets held by the Group at December 31, 2016, regardless of the actual holding rate.







ENGIE owns and operates 6 GW in Belgium Life extension post 2025 would require a change in law.

ENGIE's opinion is that investing in new nuclear plants is no longer easy for private companies alone.

ENGIE provides all services to the nuclear industry (engineering, construction, maintenance, commissioning, fuel management, dismantling,...), including ITER



## Heating & Cooling (1/2) : Ohio State University





- District energy operation of a university campus with over 410 buildings
- Selected over a 2-year period as the top bidder amongst 40 participants in the RFI<sup>(1)</sup> phase

### **CONTRACT PERIOD**

50 years INVESTMENT 1.2 B\$

### **CLIENT'S CHALLENGE**

Position OSU as international leader in sustainability

#### **ENGIE'S SOLUTION**

Innovative 50-year public-private partnership deal to operate and manage OSU's Columbus campus utility system comprising electric, steam, heating, natural gas and chilled water facilities

#### **CLIENT'S BENEFITS**

25% committed energy consumption reduction in 10 years



## Heating & Cooling (2/2) : Middle East





Qatar (44% stake in Qatar Cool): 3 power plants (West Bay x2, Pearl)

(Abu Dhabi – 39 ; Dubai – 18

Oman (60% stake in Tabreed Oman): 2 power plants (KOM, Oman military college) 0.1 GWc<sup>(1)</sup>



**71 District Cooling plants** ~3.5 GWc installed capacity



**90% EBITDA** capacity-indexed



Solid off-takers 60% of revenues from government bodies







### **Improving performance**





### **Preparing the future**



#### AIMS



#### **KEY POINTS**

Key Programs Green hydrogen Offshore wind

ENGIE Fab Study of additional sources of growth over a 5-10 year period

#### **ENGIE Digital** (examples)

Darwin renewable infrastructures management platform Delta predictive maintenance project

#### Incubation 30 projects hosted to date

#### **ENGIE New Ventures**

Stakes owned in 14 start-ups and 9 funds as at end-June 2017

#### Acquisitions Focused on high-potential businesses EV-Box, Icomera, etc.

#### **CORPORATE & CAPITAL SIZE**

As competitive advantage in global market

- Many several markets ; no one size fits all.
- Size allows to pay for R&D and Innovation costs, and to gain a competitive advantage on global markets where the same solutions can be replicated everywhere. For instance in heating & cooling our leadership position allow ENGIE to keep expertise and technological advance.
- But some markets are fragmental. For instance in services, advantage is more through agility, local teams and capacity to chose where to be present.

### **Adapting the Group**





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# **Prospect of gas business**



### A growing world gas demand



Many expert studies (including the IEA) confirm that gas will account for a quarter in the energy mix in 2040, all uses combined.



## A major role for gas in energy transition

A lever to fight against climate change



Replace coal with gas to produce electricity reduces CO<sub>2</sub> emissions by 60%



An ideal « partner » for renewable energies



CCGT reach their full capacity in one hour, unlike several hours or days for nuclear or coal power plants.



A solution to improve air quality



Replace diesel with gas allows to reduce :

- 100% SOx emissions
- 90% NOx emissions
- 99% fine particles



A key role in the energy transition, replacing coal and oil, and essential in the future renewable energy mix.



## **Biogaz – biomethane : significant potential for development**

### A favourable global context

In 10 years :

- Increase in world population
- Increased in waste production



# Biogaz and biomethane, a solution



- To the need of clean energy production and storage
- To the major problem of waste incineration and energy recovery
  - To the development of sustainable agriculture

ENGIE sees strong development potential in 1<sup>st</sup> and 2<sup>nd</sup> generation Biogaz and Power-to-Gas + Methanation

### Hydrogen : a huge and promising market

### **Global market outlook for 2050**

In a +2°C scenario, hydrogen could represent :



### Important steps by 2030



1 out of every 10 vehicles sold uses hydrogen in the precursor states (California, Japan, Deutschland, South Korea)

14 million tons of hydrogen to produce heat for industrial use



Huge potential to replace grey hydrogen in industry, mobility and energy

SOURCE : Hydrogen Council; IEA ETP Hydrogen and Fuel CBS; National Energy Outlook 2016

### Hydrogen : projects under development

#### JUPITER 1000

- First industrial demonstrator of Power to Gas with a power rating of 1 MWe for electrolysis and a methanation process with carbon capture.
- Green hydrogen will be produced using two electrolysers involving different technologies, from 100% renewable energy.
- The installation will be based on an innovative mathanation technology and the CO2 will be captured on a nearby industrial site.



#### OTHER PROJECTS

- Zero Emission Valley, France : developing a network of hydrogen refueling stations over a territory, supported notably by the deployment of H2 range extenders kits from Symbio Cell.
- Several prospects of large scale renewable hydrogen production to serve industrial players' needs.
  - Hyport : production, distribution and storage of green hydrogen for Toulouse and Tarbes airports, France
- · Several prospects globally to develop zero emission mobility solutions integrated with renewable supply.
  - Launch of hydrogen bus line in the city of Pau, France

### **ENGIE's priorities for gas in energy transition**

Replace coal with gas in power plants (1 900 GW capacity in the world)

Supplement renewables to provide flexibility to the electrical system (manage peaks)

Focus on gas infrastructures and customer solutions (divest LNG and EPI)

And make the gas green !



# **Questions & answers**