

REDUCING GAS DEPENDENCY BY CONSUMING BETTER: A WORKING MODEL FOR ENERGY EFFICIENCY IMPROVEMENT

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LEADING THE ENERGY CHANGE



AGENDA



BUSINESS MODEL INSIGHT

EDF FENICE AT A GLANCE

The ESCO player



The energy efficiency is the result of several improvements proposed by an ESCO and implemented together with the customer



ESCO (Energy Services Company)



Know-how of best available technologies and equipments

Good understanding of energy uses in the production process

Optimized way to operate the energy and utility plants

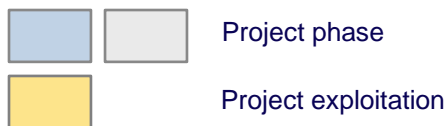
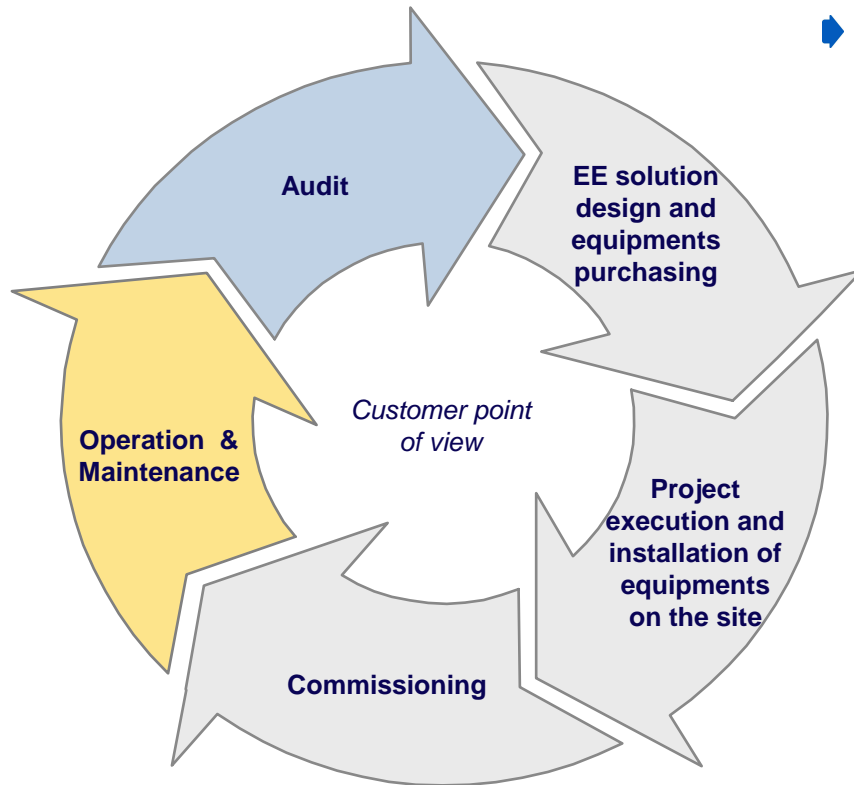
Best practices to maintain a L/T high efficiency and reliability, reducing costs

CRITICAL SUCCESS FACTOR

Energy Efficiency Services



Project development and main milestones



◆ The delivery of energy efficiency services at site level for an industrial customer entails some key stages:

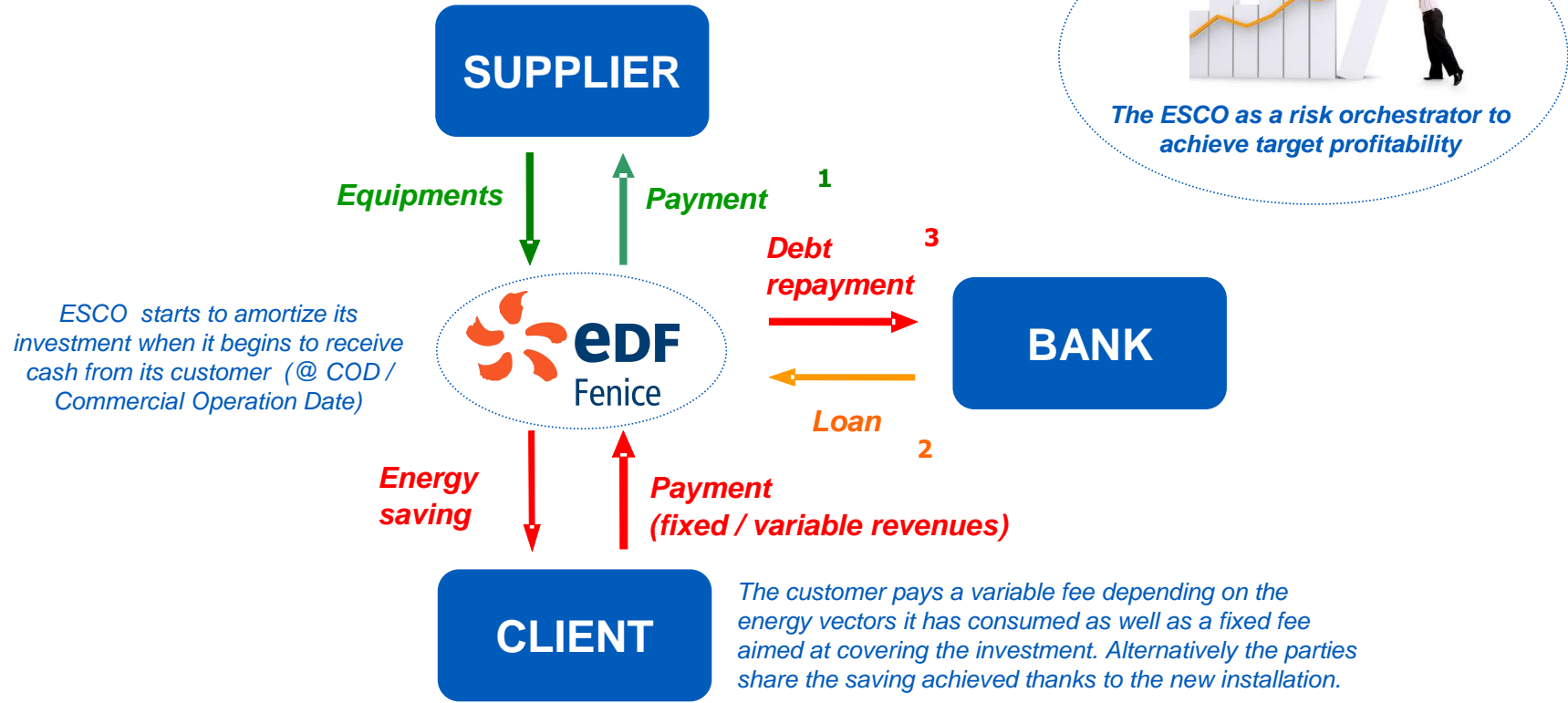
- the **audit** allows to define main potential improvements in energy consumption to achieve compared to current situation
- the **design** defines the technical solution to put in place and the procurement of best equipments on the market
- the **execution** relies on the overall process that leads to the installation of the EE solutions on the customer production site
- the **commissioning** aims at verifying that the installation meets required target in terms of efficiency
- the **O&M** (on site or in remote) is meant as the operation and maintenance of the installed system and the management of the link with the electric grid

◆ The **assets are owned by the ESCO** during contract duration and **transferred to the client at the maturity.**

Business model



BOOT (Build / Operate / Own / Transfer)

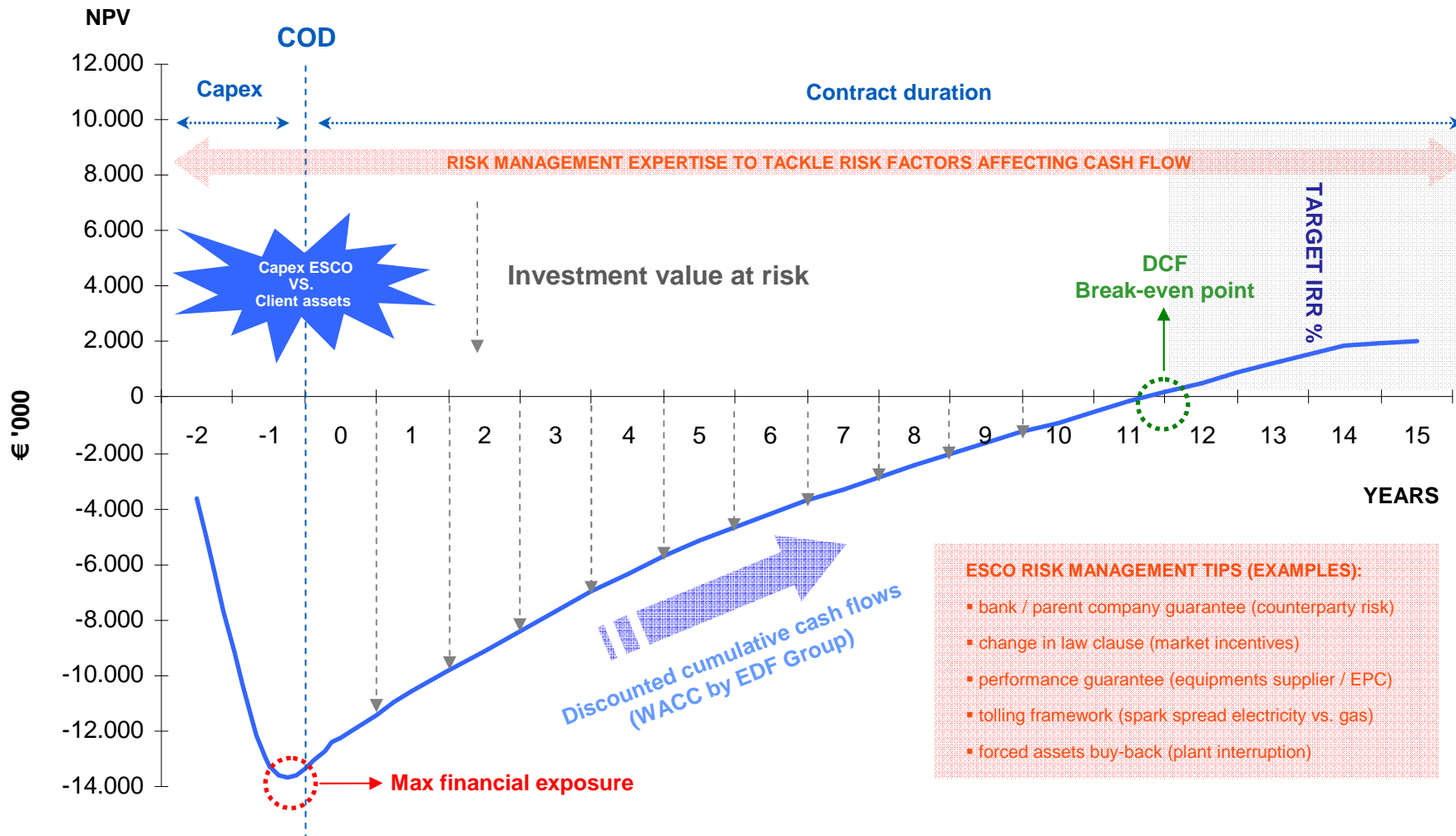


- 1) Once the contract is signed with the client, the capital expenditure is born by the ESCO (i.e. order of the equipments to suppliers and subsequent settlement process)
- 2) The required financial amount is assured to the ESCO by reference banks through loans
- 3) Loans pay-back starts when the commercial operation date of the power plant is reached

Investment profile



The ESCO as a risk orchestrator to achieve target profitability



- ESCO RISK MANAGEMENT TIPS (EXAMPLES):**
- bank / parent company guarantee (counterparty risk)
 - change in law clause (market incentives)
 - performance guarantee (equipments supplier / EPC)
 - tolling framework (spark spread electricity vs. gas)
 - forced assets buy-back (plant interruption)

Contract frameworks



ESCO engaged in the business of EE services to industrial customers / power plants with the goal of optimizing their energy usage and costs

ENERGY PERFORMANCE CONTRACT

- Implementation of energy audits based on specific technologies (VSD for motors, compressed air retrofit, heat pumps, etc.) and carried out with selected EE equipment firms.
- EDF Fenice provides tailor made EE solutions (design, implementation, financing and operation) aimed at the achievement of EE savings in the production cycle.
- Energy savings are shared with the client based on investment / contract duration and methods used to calculate energy efficiency are transparent and discussed with the client.
- Contract duration range: 10 - 15 years.

COGENERATION TRIGENERATION

- Design, finance, build and operate of cogeneration / trigeneration power plants for industrial facilities able to guarantee the overall energy supply.
- Energy vectors produced by the plants, i.e. electricity + thermal energy (heating, hot water, steam, cooling), are sold to clients at competitive prices.
- The assets are the property of EDF Fenice until the end of the contract.
- Contract duration range: 10 - 15 years.

UTILITIES MANAGEMENT

- Scope of work is utility production (steam, hot & chilled water, compressed air, electricity, etc) and the service offered entails essentially the operation and maintenance (O&M).
- Two options: assets owned by EDF Fenice or owned by the client but managed by EDF Fenice.
- Definition of an energy efficiency performance and a guaranteed quality requirement (with potential penalties) / investment plan annually defined with the client + buy-back clause @ NBV.
- Contract duration range: 5 - 10 years.



Main target customers

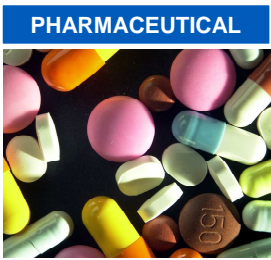
EPC (Energy Performance Contract)

**ENERGY
PERFORMANCE
CONTRACT**

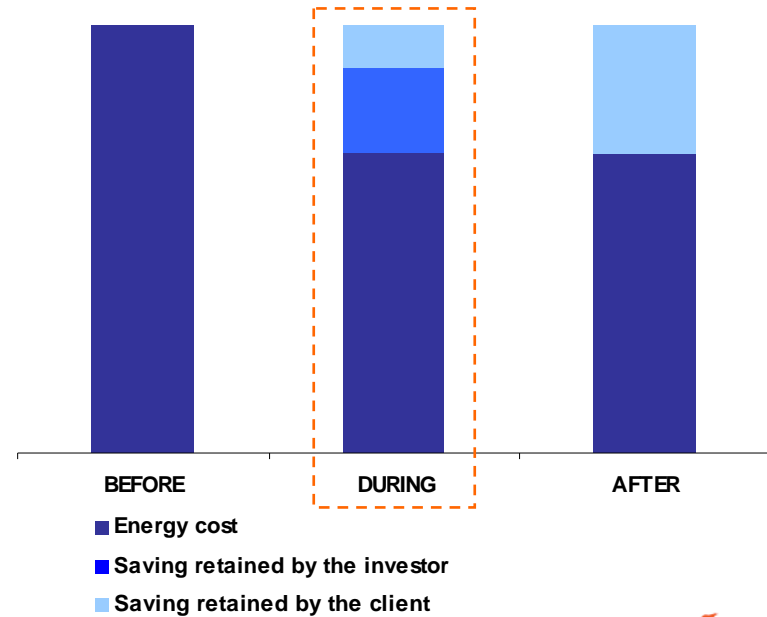
CUSTOMER VALUE

- Energy facilities renovation with best-in-class technologies
- Access to external capital (no capex disbursement, releasing resources to core business)
- Risks transfer to the ESCO (technical / financial / saving achievement)
- Cost reduction and optimization (personnel, gas, etc.)

Examples of sectors suitable for EE services



Energy savings sharing mechanism



AGENDA



BUSINESS MODEL INSIGHT

EDF FENICE AT A GLANCE

Company highlights



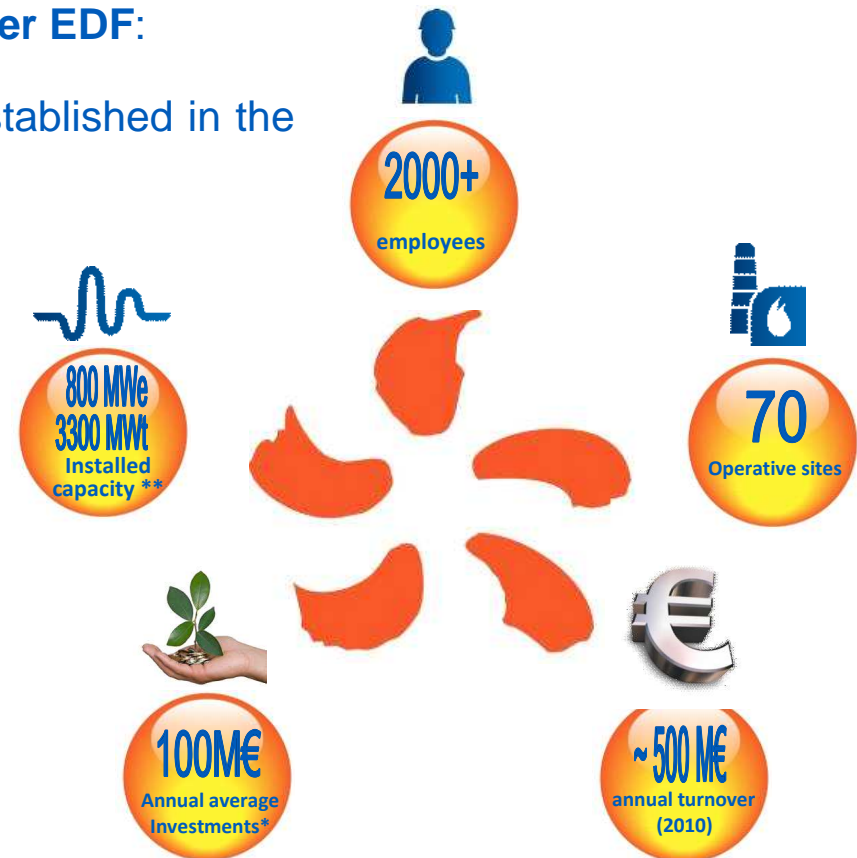
EDF Fenice is a subsidiary controlled by EDF Group

◆ Subsidiary backed by the leading energy player EDF:

- part of EDF Group since 2001 (formerly established in the early 90's within Fiat Group)
- 100%-owned by EDF International
- HQ in Italy + 3 direct branches in Europe

◆ Specialized in delivering innovative energy efficiency and environmental services:

- integrator of a wide range of energy services (ESCO business model)
- focus on industrial market (B2B)
- scouting best-in-class technologies with an independent approach from equipment manufacturers



(*) Average value last 4 years of which half for FIAT Group

(**) Of which 300 MW in Operation & Maintenance

Presence and references



GEOGRAPHICAL PRESENCE

ITALY / SPAIN / POLAND / RUSSIAN FEDERATION



MAIN REFERENCES

AUTOMOTIVE



FOOD & BEVERAGE



CONSUMER GOODS



CHEMICAL



AEROSPACE & DEFENCE



DIV. CONGLOMERATES



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Main activities



EDF Fenice focuses on industrial market (B2B)

HIGH CAPITAL INTENSITY

COGENERATION



COMPRESSED AIR



UTILITY MANAGEMENT



LOW CAPITAL INTENSITY

ENERGY AUDIT



LED LIGHTING RETROFIT



O&M



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Developing energy efficiency in Russia



AvtoVAZ is main Russian car manufacturer formerly known as VAZ and owner of the “LADA” brand. Its **Tolyatti factory** is one of the biggest in the world, with over 140 km of production lines (overall production capacity of approx. 1 million cars / year), and is unique in that most of the components for the cars are made in-house. In 2008 **Renault-Nissan Group** acquired a 25% stake in the company accordingly to a strategic partnership. AvtoVAZ made a 3.6 billion ruble (€ 89,3 million) net profit in 2010 following a 49.2 billion ruble loss in 2009.



- Set up of a brand new branch in Russian Federation in late 2009 (**EDF Fenice Rus** / HQ in Moscow) operating as a local **ESCO**.
- **Partnership agreement** signed with AvtoVAZ aimed at implementing **energy efficiency** projects in the Tolyatti plant (Samara region).
- “**BOOT**” business model based on a **10-year** contract maturity (assets owned by Fenice and transferred to client at maturity).
- **Tariff design** based on a fixed part (capex pay-back) and a variable part (performance factor related to savings achieved).
- Bank **guarantee** provided by AvtoVAZ on monthly regular payment.



3 energy efficiency projects already in operation (Tolyatti plant)

Compressed Air Production



- Compressor air station revamping (14 compressors: 4 x 20.000 Nm³/h + 10 x 15.000 Nm³/h)
- Signed in November 2009
- COD: December 2010

- Energy saving: 40%
- 70 GWhe / year
- ~200 M RUB (5 years median)

Heating System Optimization



- Installation of 15 heating stations (circulation of water back into the battery of air handling units)
- Signed in June 2010
- COD: February 2011

- Thermal energy saving: 20%
- 132.600 G cal / year
- 92,6 M RUB (5 years median)

Power Factor Corrector



- Installation of 161 PFC to re-phase capacitor on the power line feeding electrical motors
- Signed in November 2011
- COD: February 2012

- Energy saving: 7%
- 4 GWhe / year
- 13 M RUB (5 years median)



Compressed air production milestones

June 2010



BEFORE

August 2010



DISMANTLING

October 2011



AFTER

- Supply of compressed air by 14 compressors and dryers (compressor rooms n. 2 / 3 / 5) feeding the car production cycle in the Tolyatti plant
- Equipments installation completed almost 1 year later the start-up of the dismantling process
- Total expected saving (40%) coming from: 20% installation of new centrifugal compressors + 10% improvement of working load (blow-off avoided) + 10% installation of new air dryers (air leaks reduced)
- Overall investment of about 500 M RUB (~12,5 M€) incl. BOP, dismantling and adaptation



ATTACHMENTS

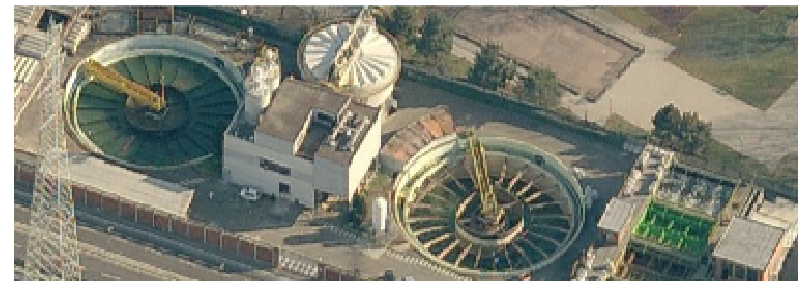
EDF FENICE CASE HISTORY

FIAT MIRAFIORI / EDF Fenice Italy



UTILITY MANAGEMENT

- ◆ **Company:** Leader company in automotive sector
- ◆ **Site:** Torino (TO)
- ◆ **Technology:** Combined cycle with 2X60MWe gas turbine and 6X5MWe steam turbine to produce electricity and heat
- ◆ **Electrical output:** 502 GWh/year
- ◆ **Thermal output:** 530 GWh/year
- ◆ **Further production and management:**
 - 3 waste water and solid treatment
 - air conditioning
 - electrical substation and distribution
 - compressed air production (capacity 200.000 m³/h)
 - 3 high pressure gas boilers (100 bar)
 - 4 medium pressure gas boilers (21 bar).
 - 6 chilled water units
 - steam and superheated water distribution network
 - Import / export of electric power
 - emission trading (CO₂): 100% Fenice



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BARILLA / EDF Fenice Italy



COGENERATION PLANT

- ◆ **Company:** Leader company in the food sector
- ◆ **Site:** Pedrignano (PR);
- ◆ **Technology:** 36 MWe combined cycle with gas turbine and steam turbine to produce electricity and heat (40 MWt);
- ◆ **Electrical output:** 270 GWh/year
- ◆ **Thermal output:** 144 GWh/year
- ◆ **Further management:**
 - O&M of the existing thermal power station
 - Import / export of electric power
 - Efficiency bonus: 100% FENICE
 - Emission trading (CO2): 100% FENICE



18% Reduction of fuel consumption compared to separate production of heat & power (corresponding to 136 GWh/year)



FERRARI / EDF Fenice Italy



TRIGENERATION PLANT

- ◆ **Company:** Leader company in the automotive
- ◆ **Site:** Maranello (MO);
- ◆ **Technology:** 2 methane gas engines
 - Electrical Power: 17 MWe
 - Thermal Power: 7 MWt
 - Cooling Power: 5 MWc
- ◆ **Electrical output:** 96 GWh/year
- ◆ **Thermal output:** 30 GWh/year
- ◆ **Cooling output:** 15 GWh/year
- ◆ **Further management:**
 - Import / export of electric power
 - Efficiency bonus: 50% FENICE – 50% FERRARI
 - Emission trading (CO₂): 100% FENICE



Saving guarantee:
10% of the costs currently paid by the Client

FERRARI / EDF Fenice Italy



LED Lighting Retrofit

Fenice has realized for Ferrari a LED lighting project for production plant in Maranello.

- ◆ A more powerful unit lighting to light up the whole parking with an extra cost of only 7 k€
- ◆ 60% reduced consumption of electricity with a short pay back



..... for Ferrari was decisive also the aspect concerning the “Image” of the area!



WHIRLPOOL / EDF Fenice Italy



COGENERATION PLANT

- ◆ **Company:** World leader company in household appliances
- ◆ **Site:** Cassinetta di Biandronno (VA);
- ◆ **Technology:** combined cycle with gas turbine and steam turbine 13MWe
- ◆ **Electrical power:** 46 GWh/year
- ◆ **Thermal power:** 66 GWh/year
- ◆ **Further management:**
 - O&M of the existing thermal power station
 - Import / export of electric power
 - Efficiency bonus: 100% FENICE
 - Emission trading (CO2): 100%FENICE
- ◆ **COD:** 10/2007



18% Reduction of energy consumption compared to separate production of heat & power



COMAIS (Etex Group) / EDF Fenice Italy



COGENERATION PLANT

- ◆ **Company:** World leader company in insulation panels
- ◆ **Site:** Filago (BG);
- ◆ **Technology:** 3,5 MWe combined cycle with gas turbine
- ◆ **Electrical output:** 30 GWh/year
- ◆ **Thermal output:** 60 GWh/year
- ◆ **Further management:**
 - O&M of the existing thermal power station
 - Efficiency bonus: 100% FENICE
 - Emission trading (CO2): 100% FENICE
- ◆ **COD:** 6/2010



COMAIS srl



20% Reduction of energy consumption compared to separate production of heat & power

CAPSA / EDF Fenice Iberica



TRIGENERATION PLANT

- ◆ **Company:** Spanish leading company in the Food Industry
- ◆ **Site:** Zarzalejo (Madrid);
- ◆ **Technology:** 1 Natural Gas engine
 - Electrical Power: 1,41 MWe
 - Thermal Power: 3,09 MWt
 - Cooling Power: 0,51 MWc
- ◆ **Electrical output:** 8.123 GWh/year
- ◆ **Thermal output:** 17.767 GWh/year
- ◆ **Cooling output:** 2.956 GWh/year
- ◆ **Further management:**
 - Export of electric power to local electric utility
 - Steam and cool water for client production
- ◆ **COD:** February 2010



**Saving guarantee:
20% of the costs related to
steam and cool water production**



SATA (Fiat) / EDF Fenice Italy



COGENERATION PLANT

- ◆ **Company:** Leader company in automotive;
- ◆ **Site:** Melfi (PT);
- ◆ **Technology:** 30 MWe combined cycle with gas turbine to produce electricity and heat (44 MWt);
- ◆ **Electrical output:** 122 GWh/year
- ◆ **Thermal output:** 170 GWh/year
- ◆ **Further management:**
 - O&M of the existing thermal power station
 - Import / export of electric power
 - Efficiency bonus: 100% FENICE
 - Emission trading (CO2): 100% FENICE
- ◆ **COD:** 10/2009



18% Reduction of energy consumption compared to separate production of heat & power



SEVEL (Fiat - PSA) / EDF Fenice Italy



TRIGENERATION PLANT

◆ **Company:** World leader company automotive (commercial vehicles)

◆ **Site:** Atessa (CH);

◆ **Technology:** 34 MWe combined cycle with gas turbine and steam turbine to produce electricity, heat and cold with absorption chillers of 6 MWf;

◆ **Electrical output:** 98 GWh/year

◆ **Thermal output:** 211 GWh/year

◆ **Cold output:** 14,4 GWh/year

◆ **Further management:**

- O&M of the existing thermal power station
- Efficiency bonus: 100% FENICE
- Emission trading (CO2): 100% FENICE

◆ **COD:** 04/2011



12% Reduction of energy consumption compared to separate production of heat & power