Transizione Energetica ee i Fabbisogni dei Imprese: La Proposta di Enel X

Sonia Sandei, Head of Distributed Generation
Enel X
Milano, 9/05/2018
The evolution of the energy sector

Decarbonization

Electrification

Digitalization

New customer needs

Renewables penetration by 2040: 60%

By 2040, electricity will be the first source of energy consumption: share of 38%

Digital electricity infrastructure investments: +45% between 2014 and 2016

New customer needs lead to customized services development with sustainable approaches

The energy sector is experimenting a deep transformation

Digitalization and customer centricity will change the sector paradigm

The evolution of the energy sector

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A new Global Business Line: Enel X
Our portfolio of solutions in the 4 Global Product Lines

**e-Industries**
- Consulting and auditing service
- Distributed generation on/off site
- Energy efficiency
- Demand response and demand side management

**e-Mobility**
- Charging infrastructure (public & private)
- Maintenance and other services
- OEM back-end integration
- Vehicle Grid Integration

**e-Home**
- Installation, maintenance and repair services
- Automated home management
- Financial services
- Home 2 Grid

**e-City**
- Smart lighting
- Fiber optic wholesale network
- Distributed generation & energy services
- Demand response and demand side management

*Flexibility*
Our Recent Acquisitions
Targeted M&A operations to deliver in the new energy ecosystem

Acquisition of Demand Energy and its best in class platform for the behind-the-meter distributed resources and storage management.

New industry understanding with the acquisition of EnernNOC, world’s largest provider of demand response and energy intelligence software.

Acquisition of EMotorWerks, developer of the market leading smart EV charging platform – Juice Net – that interfaces with local utilities & grid operators to optimise EV charging costs, reduce peak load and balance renewables.
The energy ecosystem we want to build
Flexibility throughout the entire energy system

The Energy as a Service value chain

Advise | Supply | Optimize | Flexibility

Demand response
Demand side management
Vehicle 2 Grid

Connected charging stations
Smart charging
Aggregation platform

Home 2 Grid

Best positioned to serve new customers’ needs
e-Mobility
How electric cars can help us in building the new energy ecosystem

**Demand Response**

**Interruption** of a charging session in progress or **deferred startup** of the charging session; **aggregation** of each single start and stop is equivalent to the contribution of an interruptible heavy energy consumer.

**Ancillary services through Vehicle 1 Grid**

Modulation of a charging session in order to provide frequency regulation services. It increases the flexibility of the network and helps mitigate overload risks or increase the capacity of renewables.

**Ancillary services through Vehicle 2 Grid**

Return of power from car battery to the network; it is used for frequency regulation. Each car contributes with the power that the bidirectional charging station makes available.

**Energy 2 Grid**

Return of energy from the car battery to the electricity grid can allow the supply of portions of the network in emergency conditions or participate in the wholesale energy markets.

**Product developments**

Car manufacturers
We chose Italy even if…

«Technological neutrality» when it comes to alternative transport policies

Tail-end when it comes to electric vehicles circulating on the road

Contradictory messages from main Italian carmaker strategy
We are pushing ahead because...

- **Secured partnerships** with key committed carmakers and stakeholders
- e-Mobility as an **opportunity of industrial development** in Italy
- **First mover** in the e-Mobility Revolution

By 2022 14,000 infrastructures installed
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Up to 300 M€ CAPEX by 2022
Our e-Mobility supply chain

**Supply**

Specialized companies in the mechanical sector, automation, inverter production and other electrical equipments

~2,000,000 working hours

~ 50 business partners to be selected with competitive processes
- Tender for installation and maintenance: December 2017
- Tender for supply: March 2018

CAPEX ~200M€

**Installation and Maintenance**

Medium enterprises specialized in electrical works

**Potential revenues in the e-Mobility Sector by 2030 in Italy: up to €300 billion**

*Source: The European House Ambrosetti, Study e-Mobility Revolution*
e-Industries
Il mercato elettrico è sempre più complesso...

Your efforts need to be focused on your core business without being worried about the continuous changes of the energy market.

We can support you in turning complexity threats into opportunities.
Our Mission

Manage opportunities and needs of our customers energy portfolio, leveraging on services and products which enable the optimization of energy use and cost, also through innovative financial tools and business models to mitigate risk exposure: from sourcing to utilization, from monitoring to demand/generation programming and control, from portfolio strategy to the aggregation of all the sources of flexibility.
We help thousands of businesses introducing Energy as a Service to take advantage of new technologies, leveraging on:

- Digitization
- Customer centric approach
- New paradigm mind set
- Continuous innovation
- Sustainability
Take advantage of new energy solutions to monetize the flexibility embedded in your business

- More than 50 years of technical expertise in enabling energy for our Customer: we know how to use energy and how to monitor it.

- New industry understanding through inorganic growth

50 years enabling power

Best in class platform for the behind-the-meter distributed resources and storage management

World’s largest provider of demand response and energy intelligence software.

The solution which would maximize the value of electric vehicles enabling revenues streams from grid services
The benefits we bring

We’re the energy partner for our customers, seeking to empower their business through maximizing the value of energy

1. **Earn Revenue** – monetize flexibility of existing assets in electricity markets
2. **Reduce Cost** – use less energy, get the best price for energy, and lower demand charges
3. **Improve Resiliency** – protect against operational disruptions and power quality issues
4. **Improve Sustainability** – reduce greenhouse gas emissions and waste; meet renewable energy goals
5. **Manage Risk** – address compliance issues, manage market exposure and budget certainty
6. **Increase Transparency** – increase visibility into how energy usage impacts all of the above
La proposta ENEL X

Audit & Monitoring EIS

Gestione intelligente dell’intero ecosistema

Cogenerazione/Trigenerazione e altre soluzioni di efficienza energetica

Solare + storage
Generazione distribuita

IdR e Veicoli Elettrici

Direct Marketing

Demand Response
Nuove risorse di Flessibilità basate sulla domanda
Enterprise-wide strategic energy advisory services to achieve organizational goals, assess historical energy performance and identify energy efficiency potential.
Electricity procurement options from off-site sources in deregulated markets or on-site generation including cogeneration systems, solar energy, energy storage, etc.
Advanced ongoing monitoring of disaggregated user loads and building automation systems to optimize operations.

- Monitoring and verification: Open an eye on your energy portfolio
- Energy Efficiency: Reduce your energy need
<table>
<thead>
<tr>
<th>PROGETTO</th>
<th>MW</th>
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<tbody>
<tr>
<td>ZEGNA BI</td>
<td>3</td>
</tr>
<tr>
<td>PERDERZOLI VR</td>
<td>0,8</td>
</tr>
<tr>
<td>RINO MASTROTTO VI</td>
<td>1,2</td>
</tr>
<tr>
<td>CORDEN PHARMA LT</td>
<td>6,8</td>
</tr>
<tr>
<td>ELMA CART SRL FR</td>
<td>2,7</td>
</tr>
<tr>
<td>BUNGE SPA RA</td>
<td>5,5</td>
</tr>
<tr>
<td>SIL SOCIETA' ITALIANA BS</td>
<td>1,5</td>
</tr>
<tr>
<td>LASTRE SPA RA</td>
<td>0,8</td>
</tr>
<tr>
<td>PETROLIFERA ITALO RA</td>
<td></td>
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<tr>
<td>RUMENA SPA</td>
<td></td>
</tr>
<tr>
<td>SKY (sede centrale MILANO) MI</td>
<td>3,3</td>
</tr>
<tr>
<td>BONZANO GROUP (I-PAN) AL</td>
<td>2,5</td>
</tr>
<tr>
<td>DOPLA TV</td>
<td>1,2</td>
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Progetti Industry
Progetti CHP Formula «ESCO» - Impianti in Esercizio

<table>
<thead>
<tr>
<th>IMPIANTI IN ESERCIZIO</th>
<th>(MW)</th>
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<tbody>
<tr>
<td>Lanificio Zegna</td>
<td>3</td>
</tr>
<tr>
<td>Conceria Rino Mastrotto</td>
<td>1,2</td>
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<tr>
<td>Casa di Cura Pederzoli</td>
<td>0,8</td>
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<tr>
<td>Cordenpharma - Farmaceutica</td>
<td>6,8</td>
</tr>
<tr>
<td><strong>TOTALE</strong></td>
<td><strong>11,8 MW</strong></td>
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Il Progetto si è aggiudicato il premio **Energy Efficiency Award 2017** per il modello di finanziamento innovativo assegnato dal Centro Studi sull’Economia e il Management dell’Efficienza Energetica (CESEF).

In particolare il premio è stato assegnato per la **forma contrattuale innovativa** in un settore critico per l’efficienza energetica, quale quello dei grattacieli, che **coniuga gli strumenti di incentivazione e la leva finanziaria**

Sostituzione di caldaia a gas metano con N. 2 pompe di calore e rimozione di gruppi frigoriferi esistenti
Energy is now an opportunity