

Photovoltaics, wind energy and building: short-term market prospects

Special on the technological and regulatory innovations presented at Key Energy 2019



by editorial board of **QualEnergia.it**

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THE RENEWABLE ENERGY EXPO

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**ITALIAN
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Fiera di Rimini
5 - 8 November 2019

Photovoltaics, wind energy and building: short-term market prospects

**Special on the technological and regulatory
innovations presented at Key Energy 2019**

FIERA DI RIMINI, 5-8 NOVEMBER 2019

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The next decade will be decisive for the development of a national energy mix that is increasingly oriented towards renewable sources.

But it will be the next few years that determine the results for the 2030 goals and for the necessary process of decarbonisation of our economic system: the transposition of European directives, the definition of ambitious international targets, the implementation of long-term national climate and energy policies, and a renewed Energy-Climate Plan, will all be decisive factors for the acceleration that many operators have been expecting for some time.

Operators of all sizes, who need that framework of policies and regulations immediately in order to be able to implement their investment plans.

In this short special, addressed to visitors to Key Energy 2019 in Rimini, we have focused our attention on those sectors that we believe to be crucial in the short term for the expansion of the clean technologies market and for distributed generation in Italy.

We talk about new ways of producing photovoltaic and wind power, markets where there is space for residential storage, the efficiency of our building stock, and opportunities in the e-mobility chain.

Topics that, along with others, will be covered by the Companies participating in the fair and will be analyzed in the conferences and seminars organized from 5 to 8 November.

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THE RENEWABLE ENERGY EXPO

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Providing the future

5-8 November 2019
Fiera di Rimini - Italian Exhibition Group

keyenergy.it

Key Energy, the international renewable energy expo, is the main industry event in the Mediterranean countries.

Organized by the **Italian Exhibition Group**, the event, now in its thirteenth edition, is held at Fiera di Rimini and brings together all the main technologies and solutions for renewables, electrical and thermal energy efficiency, urban regeneration and sustainable mobility.

The wide range of products and solutions offered by the most important reference companies is divided into a series of parallel events: **Key Wind**, the only wind power show in Southern Europe, the Balkans and the Middle East, in conjunction with ANEV; **Key Solar** and **Key Storage**, with all the technologies and solutions for solar energy and energy storage; **Key Efficiency**, dedicated to energy efficiency, cogeneration and the world of E.S.Co; **Città Sostenibile**, the area for cities that are planning a sustainable, connected future.

Key Energy is enriched with an important new appointment this year: **DPE- Distributed Power Europe**, an international event dedicated to power generation.

Besides being a valid showcase for enterprise, **Key Energy** is also an important moment of comparison.. 50 appointments are scheduled, including conferences, workshops and training courses On 5 November, the inaugural conference of Key Energy will be presenting a **scenario study with forecasts for the development** of renewable energies and the repowering process applied to existing buildings, focusing on trends in electric and sustainable mobility.

Key Energy, where energy meets the future.

Print your free ticket for Key Energy! How?

1. **Log on** and enter the Visitors area of the site
2. Use the code: **F5KEY**
3. Download and print your ticket!

We will be presenting the new energy scenarios at Key Energy 2019



Gianni Silvestrini
KEY ENERGY SCIENTIFIC DIRECTOR

Italy is renewing its focus on renewables and electric mobility. New photovoltaic, wind, biomass and hydroelectric installations in the first seven months of this year have reached a power of 727 MW, with a growth of 86%.

Storage systems combined with PV are also starting to expand. From 15,449 connections at the end of 2018, it could reach 28,000 installations by the end of this year. And, of course, thanks to incentives, the demand for electric cars is growing, with 7,700 cars sold in the first nine months of this year compared to 3,600 in the same period of 2018.

In terms of repowering, the scenario that is emerging will allow us to switch increasingly to the “Deep renovation” of entire buildings, with significant savings. And we are only at the start of a race that should allow us to achieve ambitious results over the next decade, doubling wind production and tripling the generation of solar energy. Of course, in order to achieve these results, we will need to review certain tools and encourage new approaches.

The decree on renewables, which has been approved after years of waiting, should allow the creation of 8,000 MW in three years and we are waiting for the Fer2 decree.

Serious reflection will be required on the mechanism of white certificates, which is struggling to get back off the ground. The development of Power Purchase Agreements, which are beginning to appear in our country too, as demonstrated by the recent agreement for 120 MW PV and the

first wind PPA, must be encouraged. And we are waiting for the new rules that will allow Energy Communities to take off, encouraging the involvement of the general public.

The Climate Energy Plan will be sent to Brussels by December. It is possible that the goal of generating 55% of electricity from renewable sources will be raised. Ambitious cuts in climate-changing emissions by 2030 are being discussed in Europe. According to the new President of the Commission, Ursula Von der Leyen, the reduction should be increased from 40% to 50%. So, Italy is going to have to review its scenarios sooner or later.

In short, following the Paris Agreement, things are starting to get serious. After all, governments are being spurred on by the millions of young people who have demonstrated all over the world calling for decisive action to tackle the climate emergency.

The new scenarios that are opening up will be described and explored during dozens of conferences at KeyEnergy 2019, to be held in Rimini between 5 and 8 November.

In the inaugural session, the Energy Strategy Group of Milan Polytechnic will be presenting a new report to indicate possible scenarios on the various fronts of decarbonisation. Attention will also be paid to the opportunities opening up abroad, with sessions organised by Wind Europe and Res4Africa, and there will also be a focus on the most innovative technological solutions emerging in the various sectors.

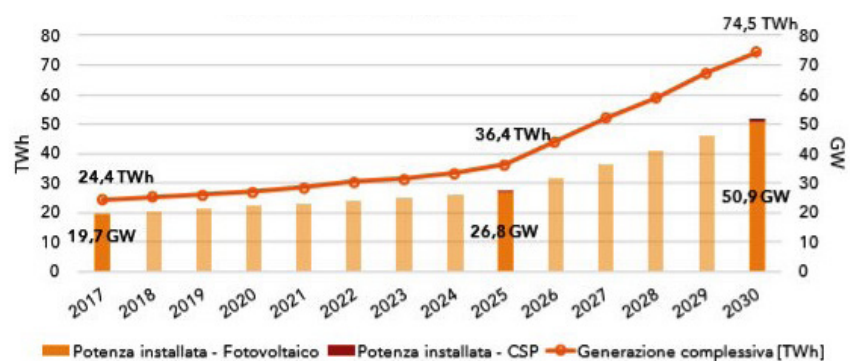
1

The new paths of photovoltaic energy

The golden years of the Feed-In Tariff, which ended at the end of 2013, are now long gone and the PV sector seems to have left the “desert crossing” that characterised the years that followed behind it, with annual installations that have dropped from several GW to a few hundred MW, essentially residential installations supported by tax deductions.

There has been a consolidation and reorientation of the sector: numerous companies have left the market, others have continued to build installations from a completely different perspective, focusing on maximizing **self-consumption**. The focus has been on the **O&M** of existing installations which, in many cases, have been essential to withstand the blow of the *Spalma-incentivi* decree. In the meantime, technology has become more competitive: small and medium sized installations **without incentives**, those based on self-consumption but not supported by **tax-deductions**, have slowly resumed and there is a new market of large ground-based installations in **market parity**, which, without incentives, are able to compete by selling electricity wholesale, almost always thanks to **PPA contracts**.

However, the relaunch is only just beginning: according to the forecasts of the National Energy and Climate Plan, there will have to be an average of 900 MW of new installations every year until 2025 and about **4.8 GW/year** from 2025 to 2030 (fig.: E&S Group, based on PNIE data).



How are we going to get there? The Fer 1 decree, which has come into force after a long wait, will make a modest contribution. But more than incentives, PV needs the removal of the **obstacles** standing in its way: the jungle of authorization procedures and the ban on **collective self-consumption**, which will be overcome with the transposition of new European directives. There are also various factors that promise to **catalyze the growth** of solar energy in the years to come, such as the expansion of **storage** systems, the opening of the **market of grid services** to renewables, the expansion of **electric mobility** and the growing demand for green energy by companies and the general public.

Conferences at Key Energy 2019

5 November

hrs 14:30 / 17:30

Evento di apertura:

Rinnovabili, efficienza, mobilità alla luce del Piano Energia Clima

6 November

hrs 9:30 / 13:00

The evolution of the Italian electricity system. Future scenarios, between decarbonisation and innovation

7 November

hrs 14:00 / 18:00

Comunità energetiche e prosumer

8 November

hrs 10:00 / 12:30

Ammodernare il fotovoltaico italiano

hrs 10:00 / 12:30

FV tra nuovi incentivi e market parity

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... we talk to
Davide Chiaroni

ENERGY & STRATEGY GROUP
 POLYTECHNIC UNIVERSITY OF MILAN

How is the Italian photovoltaic market doing?

Growth in 2019 has been more significant than in 2018, the year that marked the exit from the crisis: with a 20% increase in installed capacity. The medium and large installation segment, with installations of over 500 kW and MW, and between 100 and 300 kW, i.e. industrial and commercial projects, which had suffered the most in previous years, has also started growing again. It should be stressed that this was the case before the effects of the Fer 1 decree.

What can we expect from the new incentives?

The results of the first auction, probably conditioned by wait-and-see strategies, may not necessarily be representative: the trends will emerge in the second auction. There is no doubt, however, that the system is calibrated to relaunch the market of large installations.

Something was already moving also with projects in market parity...

This segment is already benefiting from the drop in technology costs and has reached a good level of bankability, but without incentives these investments were only possible under certain conditions, with certain local prices. The decree will result in a more widespread market.

What are the current trends in technology?

Trackers are now the standard for large ground installations. Also interesting, perhaps more for medium sized installations than for larger ones, are all the technologies that improve the efficiency of the modules, such as PERC. Considerable progress has been made in plant engineering, BOS, monitoring. On string management, the choice of inverters, mapping, for example, we have learned from the many mistakes made in the past, during the boom. I see less attention being paid to alternative technologies, like organic cells and thin film: research is dynamic,

but given the increasing convenience and reliability of conventional modules, a technological leap is unlikely now.

A lot is expected from bifacial modules. What do you think?

They offer the advantage of increasing the yield and extending the production curve. There is, however, a test to define the life of these cells and understand how permanent this effect is. This is a solution that will have to be calibrated to the use to be made of it: I would expect broader expansion of medium sizes, where it is important to cover the maximum consumption curve, than of utility scales, where sturdiness and reliability take precedence.

The PNIEC expects strong development of PV between now and 2030. Which factors are going to accelerate growth and which are holding it back?

Things are being blocked on the regulatory front, with fragmented and unclear authorization procedures and uncertainty about policies. Among the development enablers, however, participation in the grid services market is going to be very important, both for large and smaller installations, if we imagine aggregation systems.

One of the factors that the PNIEC has not reckoned with is the volatility of electricity prices: stabilisation of revenue for projects requires diversification of energy remuneration. The development of electric mobility will be another driver. Then there is the liberalisation of collective self-consumption envisaged by the new European directives: this could be a great opportunity, although we will have to deal with the technical limits: I see potential that can be exploited more in the commercial/industrial sector than in the residential sector.

2

The market and role of residential storage

When we talk about energy storage, we immediately think about the big installations for the grid, with capacities of 100 MW or even more, that are being designed in the United States, to replace part of the electricity production so far guaranteed by “peak” gas units.

But **one of the most promising trends** for the electrochemical storage market, in Europe and in Italy, is in the **residential sector**: we are talking about **small installations** with a capacity of just a few kW that are beginning to build a system of distributed generation destined to profoundly change the way in which we produce and use energy. Emerging trends include the possibility of creating new forms of collective self-consumption in apartment buildings and urban neighbourhoods, as well as the possibility of participating with **battery clusters** in the grid services managed by Terna.

When it comes to these issues, Italy is an open, rapidly evolving construction site. Suffice it to say that within the space of two to three years, the number of small storage systems (SdA) in our country has grown considerably, **exceeding 18,000 installations** in March 2019 according to the calculations - summarised in the graph below - of Anie Rinnovabili based on data from Terna’s Gaudì platform.

Conferences at Key Energy 2019

5 November

hrs 14:00 / 18:00

Digital energy with case histories on smart grids, renewables, storage systems, electric charging, smart building

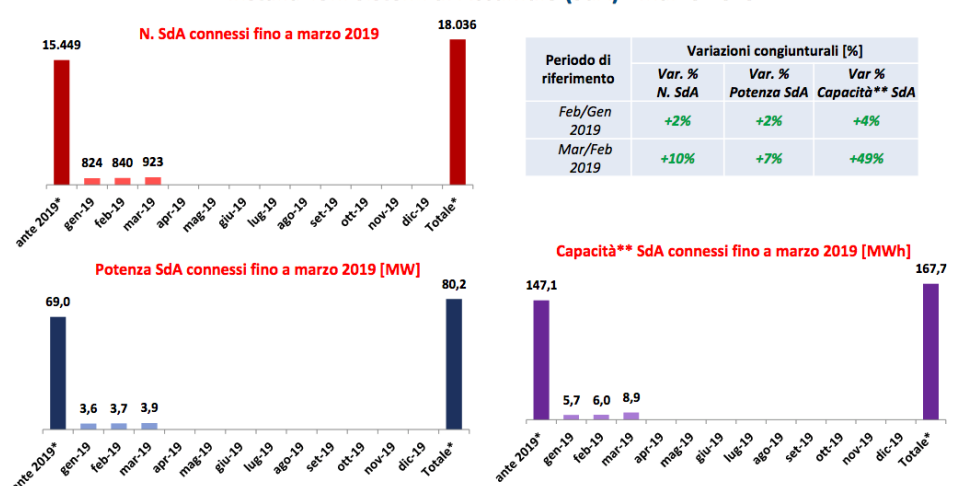
6 November

hrs 14:00 / 17:00

Le novità del Libro Bianco 3.0 sugli accumuli elettrochimici

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Installazioni Sistemi di Accumulo (SdA) - marzo 2019



Almost all of these systems have a **capacity of less than 20 kWh** and are always combined with residential photovoltaic systems. 923 SdA were installed in March alone, up 10% on the previous month.

But what are the short-term prospects of residential storage for the Italian market?



...we talk to Luigi Mazzocchi

RSE - RICERCA SUL SISTEMA ENERGETICO

The latest figures released by Anie Rinnovabili bode well for the growth of residential storage in Italy. What kind of numbers are we talking about?

For small installations with capacities of less than 20 kW, we are talking about a total connected power of about 80 MW with a storage capacity of 170 MWh. There are thousands of units, with a particularly high concentration in Lombardy, with almost 6,500 storage systems installed at the end of last March, amounting to 25 MW/50 MWh. The incentive came mainly from regional tenders, which provided nine million euros in non-repayable grants to cover up to 50% of the costs incurred to buy residential photovoltaic batteries, with a ceiling of 3,000 euros.

Meanwhile, storage costs have also fallen. How much?

The average “finished” cost for a domestic customer can be estimated at around 700-800 euros per kWh, considering both battery and installation costs. And a couple of years ago it was way over a thousand euros.

What is the “right size” for a domestic photovoltaic battery?

The system is usually sized using a ratio between the peak power of the photovoltaic system and the capacity of the battery of one to three to optimize self-consumption. For example, a 3 kW photovoltaic system with a storage capacity of 8-9 kWh can be the best solution for residential use. This can take the self-consumption of a home to 50-60% of the total energy requirements of a house.

Is investing in storage already a cost-effective option?

It's still hard to recoup the costs of a storage system exclusively with the economic benefit

of self-consumption. On the basis of our simulations in Lombardy, also considering the support of tax deductions and regional non-repayable grants, as RSE we have estimated that the investment in photovoltaic systems with batteries pays off within an average of about 5-6 years.

What can be done to make the purchase of batteries more attractive?

A very interesting way is to participate in the dispatching services market with aggregates of small residential installations, through UVAM, Mixed Virtual Enabled Units, in order to use the excess capacity of the batteries, not used in individual self-consumption, to supply certain services to the grid. In Lombardy, a few hundred users are ready for inclusion in the first experimental projects of participation in UVAM with aggregated residential batteries. And with the remuneration of these services it is possible to improve the economic return on investment.

In Italy, too, there is increasing talk about collective self-consumption and energy communities, but this trend is struggling to take off. How come?

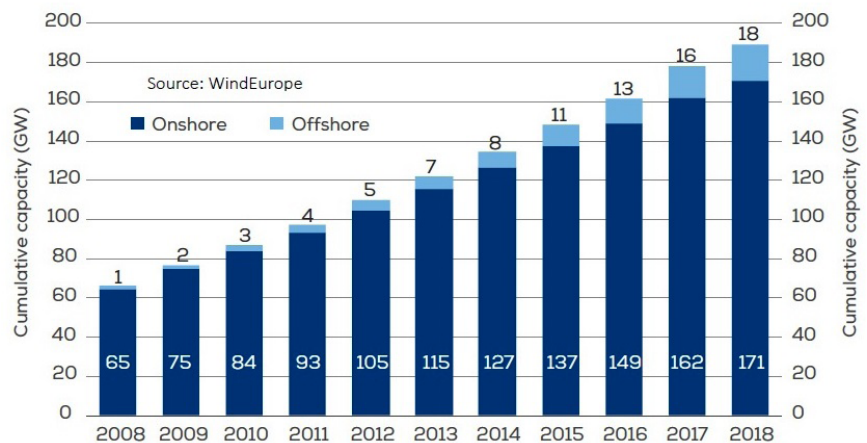
Until now, in Italy self-consumption has been possible only in self-production mode or at best on a one-to-one basis, but the recent EU directive steers Member States towards new collective self-consumption schemes on a “from one to many” basis, with the possibility, for example, of building a photovoltaic system on the roof of an apartment building, in order to then exploit the energy produced for the requirements of the individual apartments. Here we have estimated a fairly good average return time of about 7-8 years, based on self-consumption only with no incentives.

3

Wind power: business models for new and old installations

Wind power is growing rapidly worldwide. Thanks to lower costs, the global capacity of wind generation installed onshore and offshore has increased 75-fold in the last 20 years, rising to about 564 GW in 2018, according to IRENA.

According to the IEA, wind energy accounted for **4.4%** of the world's electricity production in 2017. In OECD countries, the production of wind power in 2018 covered **6.7%** of overall electricity generation. At the end of 2018, Europe had a total capacity of **189 GW**, 18 of which generated offshore, covering 14% of the demand for electricity (see figure).



Around 5% of this European wind power is in **Italy**. At the end of July 2019, national wind installations amounted to 10.7 GW (with almost 7100 turbines). In 2018, annual wind production was 17.3 TWh, representing 5.4% of the Italian demand for electricity (6.2% of domestic electricity production), in line with generation in 2016 and 2017.

Looking ahead, the IEA forecasts that, compared to 2018, global wind power will jump by nearly **65% to 839 GW by 2023**, led by China, the United States, Europe and India. Marine wind is also expected to grow rapidly, with new offshore turbines capable of operating 40 to 55% more hours than those on land.

As far as **Europe** is concerned, the development of onshore wind farms is set to play an important role in the energy transition. According to a study, it would be theoretically possible to install an onshore capacity of 52.5 TW - equivalent to **1 MW every 16 European citizens** - on 44% of Europe's unencumbered land, enough to cover the global energy demand of all sectors until 2050.

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hrs 14:00 / 18:00

PPA (Power Purchase Agreements) nel settore eolico italiano

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When can we expect to see wind power in market parity?

Andrea Tolai Bartali, Executive Director of Siemens Gamesa for Italy has said, at least “in the windiest Italian sites there are economic conditions to build wind farms in market parity”.

We are beginning to see the first **Power Purchase Agreements (PPAs)** in wind power too, private contracts for the long-term trading of energy. At least three have been announced in recent months, for a few dozen MW.

However, there are many regulatory, legislative and political obstacles in Italy, due to the fact that mediation between the many economic interests at stake is no easy task. These include the lack of certainty in the decision-making process and slow planning by the Regions. And there are the difficulties linked to the transition from public incentives to a market regime.

According to some analysts, in the phase prior to the approval of the **FER 1 Decree**, expectations regarding new incentives have paralysed the renewables operators, who had postponed their projects for fear of failing to comply with the requirements of the decree and losing subsidies.

Now that the Decree is operational, some believe that the new incentives offered through **auctions** represent “**unfair**” **competition** for market instruments like PPAs.

“Why should a wind farm focus on a PPA rather than bid at an auction, where it could receive higher returns than those offered by PPAs, over a longer term, and with banks more willing to finance an incentive-based project than one in market parity,” says **Tommaso Barbetti**, founder of energy consultancy Elemens.

Even before thinking about new wind farms in unused areas, there is much to be done in Italy to **revamp** or **repower** existing installations.

Nicolò Novati, Project Engineer of the Stantec

group, criticizes our country’s regulations, which “**make no distinction** between the construction of a new wind farm, where there was nothing before, and the complete renovation of an existing farm. This - he explains - despite the fact that the construction of a new farm involves a much more significant change in the territory than repowering, where the increase in visual impact caused by the increase in height and area swept by the rotor is mitigated by the reduction in the number of turbines”. In fact, where two to five turbines were once required, **a single turbine** would now be sufficient to produce the same amount of power, with a significant benefit for the landscape. The real figures also reveal the Italian authorisation complexities for operations carried out on **existing wind farms**.

Bearing in mind that there are approximately 5,600 wind farms operating in Italy, in 2018 the Gestore dei Servizi Energetici (GSE) received only 159 requests for intervention on installations that had already been incentivised, from minimal operations to changes in configuration, through to actual repowering with no incentives.

That means that only about **2.8%** of wind farms with incentives underwent, albeit minimal, alteration last year to. This figure isn’t reassuring for the maintained efficiency of the plants and their contribution to the decarbonisation of the national electricity mix, especially is we considering that the Italian Climate Energy Plan for wind envisages the generation of 40 TWh by 2030, more than 2.2 times the current production.

This target requires good management of the old plants and the creation of another 9-10 GW wind power in just 11 years.

4

A major project, the deep renovation of buildings

Almost 40% of final energy consumption in Italy is attributable to construction, a sector that is the source of 35-37% of emissions.

According to a report by the Ministry of the Economy and Finance and the Italian Revenue Agency drawn up in 2017 and entitled *Gli immobili in Italia*, Italy's real estate assets consist of **63 million, 800 thousand units**, of which 34 million, 711 thousand (54%) are residential buildings and over 53% of these are over 40 years old. Almost all of these buildings require **deep renovation**.

Systematic intervention in this sector requires flexibility and the ability to adapt the application of different technologies, which are now widely available: insulation, shielding systems, windows and doors, systems for the integrated management of technological functions (building automation), as well as at energy-installation level.

Thanks to this type of intervention, it is possible to reduce final energy consumption by up to 80-85%, with almost 50% of savings attributable to insulation.



Conferences at Key Energy 2019

5 November

hrs 14:00 / 18:00

Efficienza energetica
nell'edilizia sociale:
innovative opportunità
di finanziamento e
coinvolgimento degli
inquilini

hrs 15:00 / 17:30

Il green new deal per le
città

6 November

hrs 14:00 / 18:00

L'efficienza energetica
negli edifici: è necessario
cambiare passo

7 November

hrs 14:00 / 18:00

Efficientamento edifici
esistenti: tecnica e finanza

But the specificity is to be found mainly in the most appropriate **financial interventions** allowing families who are unable to afford expenses of this kind, to take advantage of this opportunity. It is necessary to evaluate **the particular property ownership structure**: lots of small owners (over 77% of Italian families own their homes), but with different levels of willingness to invest in the redevelopment of the home-asset. How can everyone have access to credit? Particular attention must also be paid to renovation/demolition **waste** from a circular economy perspective.

Transforming today's "energy drains" into "**nearly zero-energy buildings**" (NZEB) is a long, complex and hazardous process, but with an enormous potential turnover. It means relaunching the sector and intervening on buildings in the long-term (at least 50 years).



...we talk to Cecilia Hugony

TEICOS GROUP

What are the obstacles to deep energy renovation work on buildings?

The main barrier is cultural: the client, the apartment building association or the owner do not have the necessary competence to make decisions about these interventions and they do not trust the designers. They usually take a conservative approach and only opt for partial projects. Then there is the lack of competence by the professionals with whom the client takes the first step: if the professional has little knowledge of efficiency, he tries to steer choices along more traditional paths.

Which stakeholders, skills and corporate structures are required for these projects?

Old business models no longer work, because there is a complexity of technical skills and roles. For example, today we need more specialized figures who work alongside and complement the traditional architect. The designer also needs to have economic, financial and legal knowledge. Moreover, the figure of the enabler is fundamental in decision-making processes, much more so than the old-style salesman.

Important requalification interventions require a different executive process...

Construction sites need to work much faster and be better organized, as these operations are carried out on buildings with people living in them. It takes more planning and efficiency. As surprises are always lurking around the corner during demolition work, resources should be devoted to predicting these problems with surveys and studies before the project starts, saving time and money. We need companies with project management expertise. And always prefabricate when you can.

In terms of incentives, what is required to encourage these interventions?

Incentives should be stabilized for at least 5-7 years. Confirming incentives from year to year doesn't allow operators to develop serious plans. The apartment building ecobonus, starting with a 5-year horizon, has enabled the market to get organized: small operators have multiplied their offers and we are witnessing the positioning of utilities or big groups. I believe that resources should be concentrated on interventions that do not pay for themselves and would not be implemented without incentives, such as thermal insulation.

In general, legislation is lagging behind. What would you suggest to make these interventions on Italian buildings "standard practice"?

Given the generous incentives, and the assignment of credit, the existing regulatory obligations should be made operational, at energy level for example, but they are often not applied because they are not translated into municipal legislation. We need to create a link between the law and the urban planning regulations of the building practice, which often contradict each other.

Can you tell us about a significant deep renovation experience?

During an intervention on a building in Milan, we also installed an innovative system for monitoring the temperature, humidity and air quality of the apartments. A real saving of 42% was achieved and with the right behaviour, this could reach 50%. The interesting thing is that the redevelopment also brought benefits in the summer. Even with the current tax deductions, it still takes about 10-11 years to recoup the cost of these rather expensive interventions, but following the work, the positive aspects reported by the owners include a considerable increase in comfort.

5

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Digital energy with case histories on smart grids, renewables, storage systems, electric charging, smart building

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Rinnovabili, efficienza, mobilità alla luce del Piano Energia Clima

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hrs 15:00 / 18:00

Il green new deal per la mobilità

7 November

hrs 9:30 / 13:00

Forum nazionale dell'innovazione nel trasporto collettivo. L'innovazione energetica - Le prospettive economiche legate alle fonti di trazione "pulite"

hrs 14:00 / 18:00

La mobilità elettrica come motore di ripresa dell'industria italiana: un confronto

8 November

hrs 9:30 / 13:00

I combustibili del futuro: dall'Emilia-Romagna verso le strategie di sostenibilità globali

The electric mobility chain in Italy

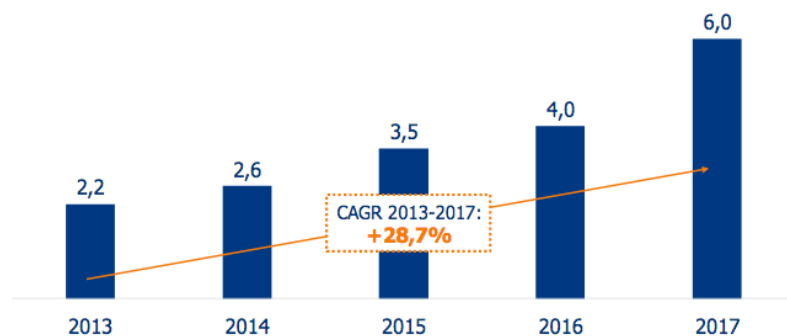
2020 could be the real turning point for the European electric car market.

Several elements point in this direction, as highlighted by a recent Transport & Environment study: the release of **dozens of new plug-in models** that can be charged at the socket, **billion-euro investments** by manufacturers to procure the components of electrified vehicles - first and foremost batteries - increasingly strict European rules for the CO2 emissions of cars sold in Europe. According to estimates, Europe's roads will be filled with up to one million new electric cars by 2020.

And **is Italy capable of seizing the opportunities** offered by this challenge?

Figures show a **relative boom in sales** of battery-operated cars: in August 2019, there were 534 Italian registrations of BEVs (Battery Electric Vehicles), taking the January-August figure to over 6,400, an increase of +108% on the same months of the previous year (source: Unrae).

However, the **share of the overall market occupied by electric cars** is still just **0.5-0.6%** and it is unlikely that the final figure for 2019 will shift much from this trend.



Meanwhile, from 2013 to 2017, the turnover of the "extended" chain of products and services made in Italy for electric mobility has grown at an average annual rate of 28.7% to reach 6 billion euros, as shown by the chart, taken from a study conducted by The European House - Ambrosetti in conjunction with MOTUS-E (the figures for 2018 are not available as yet).

So what are the short and medium term prospects for Italy's industrial and commercial supply chain of battery-powered vehicles?



...we talk to
Francesco Naso

MOTUS-E, TECHNOLOGY & MARKET AREA

Let's start with the latest market figures for electric cars: everyone is wondering when Italy is going to cross the first "psychological" threshold of one percent of total car sales...

MOTUS-E's estimate for 2019 indicates sales of about 12,000 electric cars in Italy, but this still isn't enough to reach one percent of the total market this year. It is likely that we will push through this target in 2020-2021, thanks to various dynamics.

Which are?

The release of numerous models and the presence of bonus/malus incentives, in addition to the entry into force of the limit of 95 grams of CO₂/km for new registrations. But it should be stressed that this is an average at EU level, so there could be major differences between Member States, with electricity progressing very quickly in some countries and others where traditional fuels, such as petrol, diesel and methane, continue to dominate. Italy is the second largest market for imports of diesel vehicles from Germany and by far the largest European market for natural gas-fuelled cars. So, we need to make our country attractive for electric mobility.

How?

The whole industrial chain needs to take a step forward. It is a bit disengaged at the moment, partly due to its traditional approach, with so many small and medium-sized enterprises that don't always tend to collaborate. The small size of the component manufacturers is also the main reason for the lack of liquidity and insufficient investment in research and development across the industry. And until the big player - FCA, which has announced electric models for 2020 - made a move, the rest of the supply chain stood still. We need a plan to convert part of the

national automotive industry.

How much is the Italian supply chain that gravitates around the electric car worth? We are not just talking about vehicles in the strict sense, but also about batteries, recharging columns, components and services.

We have calculated 3-6 billion euros a year as the economic value already potentially payable by Italian companies that operate, even if not exclusively, in e-mobility. The estimate includes about 10,000 companies from various industrial and commercial segments including mechanics, sensors, connectivity, power electronics and maintenance services. And we are in a global market: 40% of the components of a German model come from Italy. However, electric cars encourage many manufacturers to produce more elements in house, in order to increase profit margins, which are smaller than traditional models. So Italian suppliers have to evolve and adapt to the novelty of the electric sector.

There is also much talk of building new gigafactories, super-factories of lithium batteries within the European Battery Alliance. What role can Italian companies play here?

Some Italian manufacturers have already moved or are interested in the development of this initiative, such as the Seri-FAAM Group, Kaitek and Midac. But Italy does not seem destined to be a "champion" country in the production of lithium cells. I believe that its current role as a major player in the circular economy could make us a leading country in other segments of the value chain. In activities involving the closure of the supply chain, for example, so recycling, with the recovery of valuable materials contained in batteries, and the reuse of batteries in "second-life" applications for the stationary accumulation of energy.

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