RE-Source

European platform for corporate renewable energy sourcing

DECEMBER 2020

On-site renewable electricity and storage for corporates: business models & policy framework

Our message to the European Union

Europe's bold commitment to reach climate neutrality by 2050 is at the heart of the European Green Deal. The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all. Now more than ever, Europe can make a great leap forward towards more sustainable economic models that contribute to the wellbeing of society and support the competitiveness of European businesses.

Europe's climate leadership needs to be translated into measures that will lead to a green recovery and positive long-term impact for citizens, business, and the environment. Buildings are responsible for about 40% of the EU's energy consumption and contribute to 36% of the EU greenhouse gas emissions from energy. Measures such as accelerating the pace of retrofitting buildings with renewable energy and digital technologies that optimise buildings' performance, like smart management systems, are crucial to decarbonise the residential, commercial, and industrial sector. In fact, the potential to install solar power systems on-site in commercial and industrial (C&I) facilities is very large: forecasts show that more than 400 GW of renewable energy capacity is expected to be installed on-site in C&I from now up to 2030, leading to a very large market opportunity for developers[1]. This new renewable energy installed capacity will contribute to decarbonising the building's stock, placing Europe one step closer to reaching climate neutrality; in addition to providing significant benefits for businesses in terms of competitiveness and wide societal, health and environmental benefits.

The decarbonisation of buildings can go even further by harvesting the untapped potential for generating renewable electricity on-site in residential buildings. The potential to install solar PV on households is very large and is forecasted to reach an installed capacity of 240 GW by 2030[2]. The EU Energy Performance of Buildings Directive sets the agenda to decarbonise the building stock by 2050. To accomplish this goal, more ambitious and mandatory requirements on energy performance, energy use, and renovation targets are needed throughout the EU for both new and renovated buildings. The Renovation Wave Initiative is a unique opportunity to promote a European based industry, promote the positive impacts that green and energy efficient buildings can have on health and quality of life, and maximise an economic recovery and the creation of green jobs. For every €1 million invested in energy renovation of buildings, an average of 18 jobs are created in the EU[3]. These are local, long-term jobs that will stimulate local economic growth.

Businesses can meet their greenhouse gas emissions reduction commitments, and even achieve net-zero emissions, leveraging the potential for generating renewable electricity on-site, if the right enabling framework is in place:

- Policy schemes should be stable and predictable for businesses. Businesses would benefit from long-term national prosumer strategies, dedicated support for medium-sized on-site renewable energy installations allowing, for example, the adoption of innovative business models, and from receiving GOs for C&I self-consumption renewable energy installations.

- Policies should support a smooth customer journey, making it easy for businesses to invest in renewables. This can be achieved through better fit-for-purpose tendering schemes and by accelerating and simplifying permit-granting and grid connection procedures.

- Policies should support an easy and financially favourable ownership model. This can be achieved through simple and fair remuneration schemes of excess electricity injected into the grid for C&I prosumers, reviewing long-term loan regulations to allow for the payment of renewable energy installations from cost savings, making accessible support schemes to systems that are owned or operated by a third party, and by creating a level-playing field for storage.

- Policies should support all stakeholders in the energy market to achieve an efficient use of the infrastructure investments required. This can be done by extending collective self-consumption beyond single buildings or multiple-apartment blocks and by developing markets for storage to reduce grid congestion and contribute to reducing network costs and investments needs.

1,2. SolarPower Europe and LUT University (2020): 100% Renewable Europe: How To Make Europe's Energy System Climate-Neutral Before 2050 (Moderate scenario)
3. Building Renovation: A kick-starter for the EU recovery, Renovate Europe, 2020.

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Contents

Contents

Why have we written this report?

Driven by sustainability concerns, social responsibility, and financial reasons, businesses are increasingly seeking to reduce their greenhouse gas emissions and the cost of their electricity consumption. When there is the appropriate amount of land, roof space, or carports available, a corporate can install renewable assets within the boundaries of their facilities or just near the fence, allowing them to benefit from local natural resources, save on their electricity bill, and increase the value of their brand thanks to their commitment to reducing emissions and limiting the impact on the environment.

The International Renewable Energy Agency (IRENA) estimates that to achieve the EU's climate objectives, the overall renewable electricity share in the EU-28 would need to reach 55% in 2030[4]. To achieve this, the commercial and industrial (C&I) sector would need to consume up to 600 TWh of additional renewable electricity, on top of their current electricity consumption[5]. Today, only 10% of the EU's rooftops are fitted with solar. If the EU taps into this potential of fitting 90% of rooftops with solar, they could produce at least 680 TWh of clean electricity, which is equal to about 25% of the EU's electricity demand, and it could save up to 7 million tonnes of CO_2 equivalent each year. This potential does not include the vast amount of idle space on building façades.

In the last five years, the annual rate of installing C&I on-site solar reached 2-3 GW/year, resulting in a cumulative on-site solar installed capacity of 61 GW in 2019. The future looks even brighter for C&I prosumers: forecasts show that solar PV installed capacity may reach around 245 GW in the commercial sector and around 300 GW in the industrial sector by 2030[6]. C&I prosumers can further expand this installed capacity by installing wind farms near their facilities connected via a direct wire as well as across their whole value chain, and by encouraging corporates' customers to generate renewable electricity at home. The future is bright for businesses and residential consumers alike. In Europe, the potential for installing solar PV on households is very large with forecasts showing an installed capacity of about 240 GW by 2030[7].

The value of installing renewable energy technologies on buildings or within its premises can be maximised when coupled with behind-the-meter storage. Commercial consumers are likely to get a good match between their consumption load and on-site production profiles, yet self-consumption rates can be maximised by leveraging demand-side management and behind-the-meter batteries (or other energy storage technologies). In Europe, the forecasted storage installed by 2030 in the commercial sector is 286 GWh and in the industrial sector is 299 GWh[8]. This is a steep increase compared to the range of annual installation happening today of below 1 GWh.

Therefore, on-site renewable electricity generation and storage is set to play a large role in the transition towards a 100% renewables-based energy system. Due to complex regulations and legislative barriers in many EU Member States, however, such potential is still largely untapped. In the absence of barriers, the growth prospects of on-site renewable electricity generation and storage for the C&I sector are, as we have seen, impressive. To remove these barriers, regulation needs to change and become more favourable.

This report reveals the added value from on-site renewable electricity generation and storage for businesses and individuals.

This report aims to unlock the potential of generating renewable electricity on the rooftops of commercial facilities or near to them such as on carports or via direct wire.

This is done by reviewing current barriers in regulation, showcasing dedicated measures and practices designed to unlock the value of on-site renewable electricity generation and storage, and providing recommendations to EU and national policymakers to remove such barriers.

4,5. IRENA (2020), Global Renewables Outlook: Energy transformation 2050
6,7,8. SolarPower Europe and LUT University (2020): 100% Renewable Europe: How To Make Europe's Energy System Climate-Neutral Before 2050. (Moderate scenario)

Towards 100,000 corporates...

There are a number of different risks for corporates to consider when entering into a long-term renewable sourcing agreement compared with a traditional electricity contract. The RE-Source Platform recognises that it can be difficult for a business new to this market and has committed to creating a Renewable Energy Buyers' Toolkit to help navigate the market with increased confidence. This report is part of that Toolkit.

FIGURE 1
The European Corporate Sourcing Buyer's Toolkit

Other products in the Toolkit include:

- The *Introduction to Corporate Sourcing of Renewable Electricity in Europe* report which gives an overview of the more common models of renewable energy procurement in Europe.
- The *Risk mitigation for Corporate Renewable PPAs* report which describes the risks that corporates need to be aware of when considering a long-term PPA and provides examples of mitigating services and tools which can be used to mitigate some of the risks.
- The *European Corporate Sourcing Directory* which sets out for each European country which models of corporate sourcing are administratively possible and which are known to have been used.
- The *EFET Template Corporate PPA Contract* which can be used as a starting point for PPA contract negotiations. It was developed by the European Federation of Energy Traders (EFET) and released in 2019.
- PPA Training Courses across Europe, provided by our partner Pexapark.

The RE-Source Platform is helping **buyers** and **sellers** to work together to help simplify transactions and reduce costs in the market whilst ensuring that the innovation necessary for the development of the market is not hindered.

This is a new and constantly evolving market in Europe and across the globe. This report is designed to help corporates understand the value from generating renewable electricity on-site or near one's facilities and to learn about key actions that can contribute to unlock this value. We want to encourage corporates and their customers to be **more active in their decisions to generate and consume renewable electricity** in the European market. We hope that this will help us to achieve our goal of increasing the 100 companies leading the way in renewable energy sourcing to the 100,000 we need to make the difference.

#100to100k

Vocabulary used in this report

As in any sector, there are many ways of saying the same thing in the renewable energy and power markets sector. This often creates confusion. In Table 1 below, we have specified a set of words and phrases which we have tried to use consistently throughout this report, what we mean by them, and alternative words/phrases that can be used.

TABLE 1
List of key words and phrases

Word/phrase used in report	Meaning	Other common names/phrases
Buyer	The entity purchasing electricity from a renewable power plant	Corporate buyer, corporate off-taker, off-taker, corporate consumer, purchaser
Seller	The renewable power plant producing electricity to sell to the buyer	Producer, supplier, renewable asset developer, generator
Renewable electricity	Electricity produced from renewable energy plants	Green electricity, green energy, clean energy, renewable power, renewable energy
Renewable power plant	Solar parks, wind farms etc. which produce electricity from renewable sources	Renewable asset, renewable installation, renewable generator, generation facility, project
Energy storage	Comprises the energy stored using several different technologies: mechanical, thermal, chemical, electro-chemical and electrical	
Renewable electricity supplier	Owner of renewable power plants or renewable power plants themselves which supply electricity to end consumers	Renewable asset owner, renewable power producer
Corporate sourcing	The procurement of renewable electricity by a corporate buyer. This can be through a power purchase agreement (PPA) or other types of contracts such as leasing or green energy tariffs	Renewable electricity sourcing, renewable energy procurement
On-site generation of electricity	Electricity produced behind-the-meter at the site of a consumer or through the direct wire	
Direct-wire PPA	The renewable installation is located on land adjacent or near to the electricity consumer and the two are connected via a purpose-built direct or “private” wire	
Self-consumption of electricity	Self-consumption is the act of consuming on-the-spot all or part of the electricity produced. The consumption from the renewable energy installation happens “behind the meter”, meaning that the renewable energy generator is directly connected to the consumption point and supplies part, or all, of the electricity the consumer needs.	

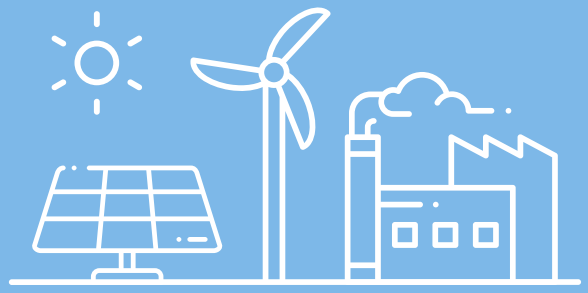
Prosumer	A final customer, or a group of jointly acting final customers, who consumes or stores electricity generated within its premises located within confined boundaries or, where permitted by a Member State, within other premises, or who sells self-generated electricity or participates in flexibility or energy efficiency schemes, provided that those activities do not constitute its primary commercial or professional activity
Energy community	A legal entity where citizens, SMEs and local authorities come together, as final consumers of energy, to cooperate in the generation, consumption, distribution, storage, supply, and aggregation of energy from renewable energy sources, or offer energy efficiency/demand side management services
Clean Energy Package	The Clean Energy for all Europeans package is a set of eight legislative acts on the energy performance of buildings, renewable energy, energy efficiency, governance and electricity market design.
Market Design Directive	Directive on common rules for the internal market for electricity (EU) 2019/944, which replaces Electricity Directive (2009/72/EC)
Market Design Regulation	Regulation on the internal market for electricity (EU) 2019/943, which replaces the Electricity Regulation (EC/714/2009)

TABLE 2
Acronyms

Acronyms	Meaning
PPA	Power Purchase Agreement
GO	Guarantee of Origin
SME	Small and medium enterprises
NECPs	National Energy and Climate Plans
RED II	Renewable Energy Directive 2018/2001 (recast) on the promotion of the use of energy from renewable sources

Part 1.

On-site renewable electricity generation and storage



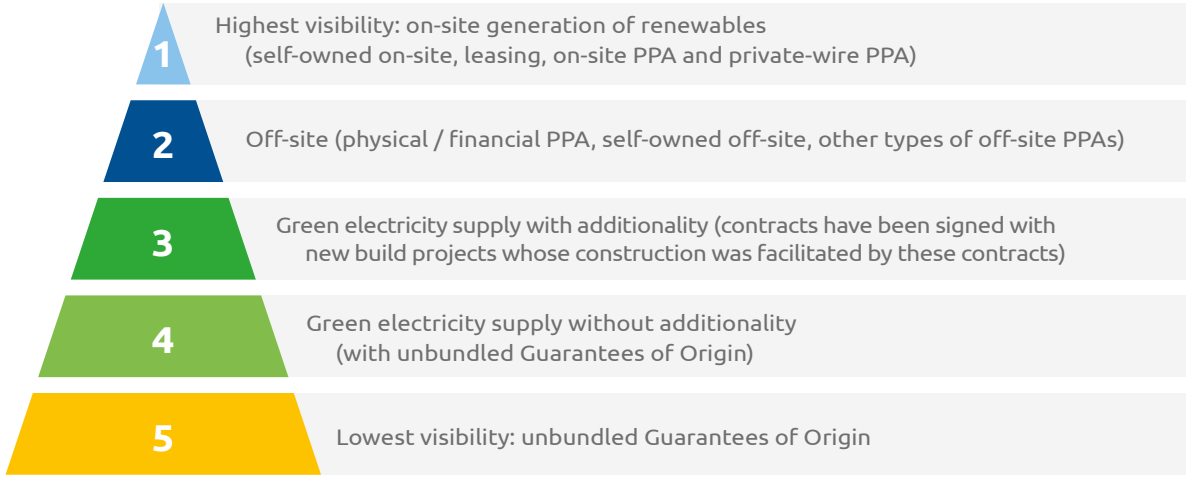
Introduction

Corporates are making serious commitments to act on reducing greenhouse gas emissions and are implementing strategies to reduce emissions in their operations or supply chains. Corporates tend to prioritise the reduction and optimisation of their energy consumption through energy efficiency measures to efficiently produce goods and services. This is the cheapest emissions abatement strategy for most sectors.

The next measure is to decarbonise their electricity supply by procuring or investing in renewable energy, such as wind and solar power. This can be done via various business models for C&I consumers. This report dives deep into the various business models.

Businesses can go even further and maximise self-consumption by installing behind-the-meter storage. Combining renewable electricity generation with storage to optimise electricity consumption, can not only maximise the efficiency of the system but also the environmental and societal benefits. Today's cost of storage is continuously falling, opening the door to accelerated deployment of different storage applications. These new storage applications can be leveraged by energy service providers to provide balancing services for power systems, and thus create new revenue streams for corporates.

FIGURE 2
Highest visibility of renewables commitment



Corporates are transitioning from being passive actors into active players in the energy transition. They can now generate, trade and store electricity and provide services to the grid, thereby becoming prosumers. This new behaviour is enabled thanks to digitalisation, as digital technologies allow for communication among prosumers and the optimisation of their interactions with the electricity system. The potential for corporate prosumers in Europe is very large and the commercial and industrial sector may see an increase of on-site solar PV installed capacity of prosumers of **1.6 times** from 2030 to 2050, while the market for behind-the-meter storage for commercial and industrial users has the potential to experience an increase of **1.8 times** from 2030 to 2050, see Table 3 and Table 4[9].

9. SolarPower Europe and LUT University (2020): 100% Renewable Europe: How To Make Europe's Energy System Climate-Neutral Before 2050. (Moderate scenario)

TABLE 3
Installed capacity of solar PV (GW) of prosumers in Europe

		2030	2030	2050	2050
		Commercial [GW]	Industrial [GW]	Commercial [GW]	Industrial [GW]
1	Norway	4.4	7.6	12.4	21.3
2	Denmark	2.4	2.0	4.1	3.3
3	Sweden	6.0	10.1	13.7	23.9
4	Finland	2.3	4.9	6.8	14.4
5	Baltic	2.0	1.8	4.1	3.2
6	Poland	14.8	14.6	24.9	23.4
7	Iberia	22.6	20.1	30.5	26.6
8	France	29.4	27.9	51.5	41.9
9	Benelux	15.7	20.0	23.0	26.3
10	British Isles	23.4	26.4	46.0	43.7
11	Germany	43.6	55.6	52.1	71.9
12	Czech Republic and Slovakia	6.9	11.5	10.9	17.1
13	Austria and Hungary	7.5	9.5	9.6	13.2
14	Western Balkans	4.4	5.4	8.2	8.1
15	Eastern Balkans	9.6	10.8	14.4	15.6
16	Italy	21.5	26.4	29.9	36.6
17	Switzerland	4.9	5.5	7.9	7.8
18	Turkey	23.5	36.9	38.3	58.4
19	Ukraine and Moldova	0.7	3.6	9.4	31.3
20	Iceland	0.1	0.0	0.4	0.0
Total	Europe	**245.8**	**300.8**	**398.0**	**487.9**

TABLE 4
Installed battery storage (GWh) of prosumers in Europe

		2030	2030	2050	2050
		Commercial [GWh]	Industrial [GWh]	Commercial [GWh]	Industrial [GWh]
1	Norway	4.0	6.2	9.7	16.5
2	Denmark	2.1	1.5	4.0	3.1
3	Sweden	6.0	8.4	11.9	20.4
4	Finland	2.2	4.0	5.6	12.5
5	Baltic	1.8	1.4	4.6	3.0
6	Poland	13.5	11.9	29.8	23.4
7	Iberia	35.1	27.7	55.6	42.6
8	France	36.1	28.3	62.2	52.2
9	Benelux	14.3	15.0	22.9	24.4
10	British Isles	22.7	21.2	47.7	39.0
11	Germany	43.6	47.5	61.0	71.8
12	Czech Republic and Slovakia	7.2	10.2	13.2	18.4
13	Austria and Hungary	8.4	9.4	12.3	15.2
14	Western Balkans	4.9	5.4	13.1	10.5
15	Eastern Balkans	11.8	11.6	20.7	21.5
16	Italy	29.9	33.0	49.9	50.5
17	Switzerland	5.8	5.4	11.7	9.7
18	Turkey	37.1	51.0	70.2	90.5
19	Ukraine and Moldova	0.0	0.0	8.0	30.1
20	Iceland	0.0	0.0	0.3	0.0
Total	Europe	**286.4**	**299.1**	**514.3**	**555.4**

The value of on-site renewable electricity generation and storage

Corporates need to carefully evaluate all aspects associated to the deployment of renewable energy before making any investment decision. An important aspect to consider when making the decision is the concept of value from generating renewable energy on-site or near their facilities.

Value of on-site renewable electricity generation for businesses and individuals

- **Optimise use of space available**: Renewable energy systems can be installed on rooftops or on building facades, making them ideal in areas where open space is limited. They can also be installed near to the corporate's facilities or as stand-alone systems (i.e. systems that are not connected to the grid – direct wire) on carports.

- **Lower grid connection costs**, from more efficient use of the grid connection. One grid connection for consumption and generation is cheaper than two grid connections. Same logic applies to other combinations, e.g. wind plus solar PV, or self-consumption plus storage. If the two benefits outweigh possible downsides (poorer economies of scale), then competition against market price should reveal whether on-site renewable energy solutions are attractive.

- **Hedge against financial risks.** On-site renewable electricity generation can reduce consumers' electricity bills by decreasing exposure to fossil fuel price volatility, which may lead to higher prices for grid-connected electricity. Therefore, installing renewable energy on-site allows all types of electricity consumers to better anticipate and plan for future electricity-related expenditures.

- **Support economic growth through local job creation.** On-site renewable electricity generation can help stimulate local economies, thanks to the purchasing of system components from local businesses and the hiring of local installers and maintenance providers, thereby increasing local employment and developing local markets associated with these technologies.

- **Show leadership in contributing towards clean and sustainable societies.** Installing renewable electricity generation on-site and near site increases the visibility and the credibility of corporate's commitments to renewables, the environment, and society, while also embracing the participation of employees, customers, and local stakeholders.

- **Empower corporates to deliver a "consumer-powered" Energy Union**: Removing barriers for generating renewable electricity at the household and community level would allow new business models to emerge, providing new revenue streams to citizens.

- **Mobilise investments in renewable electricity sector**: By self-consuming its own electricity, the self-consumer finances the deployment of new renewable energy capacities.

- **Better use of grid, lower grid losses**, reduced need for grid expansion.

Value of behind-the-meter batteries for businesses and individuals

There are two main functions for batteries, for internal/consumer needs and for the grid service.

- **Maximise economic benefits**, by maximising self-consumption rates and optimising electricity needs, eliminating generation and load peaks, and reducing network costs and investments needs.

- **Reduce consumers' electricity bill**, storing clean electricity when prices are low and using it when prices are high. By implementing time-of-use tariffs, batteries can allow consumers to reduce their electricity bills. Batteries would be charged during off-peak hours when tariffs are low; when tariffs are high, consumers can opt to discharge the batteries. Create new revenue streams through the provision of energy services: Batteries can inject electricity extremely fast (<50 ms) and with higher accuracy than conventional generators, to provide power system reliability services. The provision of ancillary services to the grid may comprise load shifting, frequency regulation and reserves. By doing so, batteries can create new revenue streams for companies, ultimately leading to increasing the wider adoption of batteries. Future business opportunities may be for companies with large storage capacities to support the provision of grid stability and obtain a financial compensation for such service.

- **Reduce hard costs, such as investment costs of renewable energy installations**. For example, in a solar PV system, the addition of storage unlocks the ability to reduce the KW_p size of the energy installation, as the self-consumption rate increases with the addition of storage. That is, by pairing the solar system with batteries, the size requirement of the solar system can decrease by as much as 25%. Additionally, by incorporating energy efficiency measures or other demand-respond measures into building design, alongside batteries, the required PV system sizes can be downsized by 40% or more[9].

- **Enables the integration of on-site renewable electricity generation**, to unlock the benefits of distributed generation: The other function for batteries is for grid service and are outlined here in this point and in the one below. Batteries can facilitate the integration of renewable electricity into the grid by smoothing the power output from variable renewable energy sources and controlling the ramp rate (MW per minute) to eliminate rapid fluctuations in the grid.

- **Reduce congestion in electricity grids**: Batteries can store electricity produced in times when the grid is too congested. This can reduce electricity losses by allowing more efficient use of the grid. This value is maximised when many batteries are aggregated using software platforms, and their behaviour is controlled together.

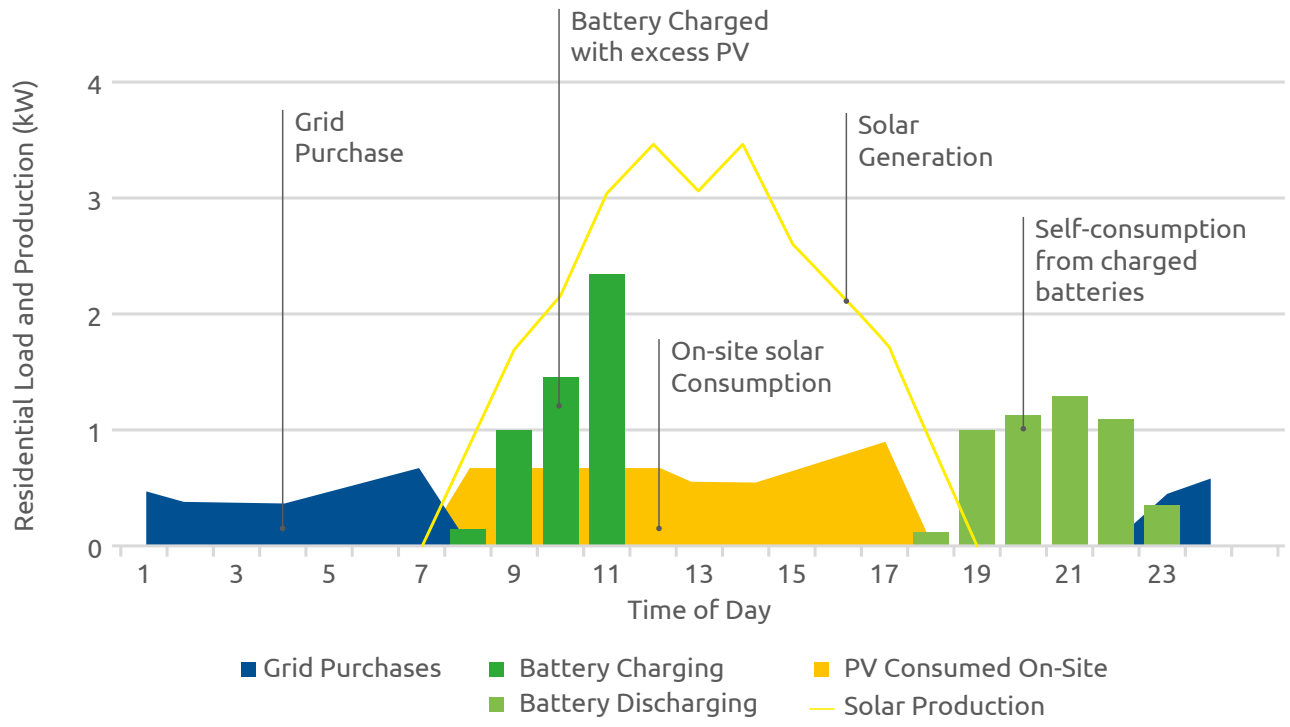
Examples of cost savings from installing wind or solar on-site

- Decathlon is experiencing in Europe, on average, cost savings of 25% when consuming renewable electricity on-site than when consuming electricity directly from the grid.

- The IKEA store in Berlin Lichtenberg is one of the most energy-efficient in central Europe, resulting in an emissions reduction of 1100 t CO_2 per year as well as a 40% reduction in primary energy costs. That is achieved, among others, through a 575 KW_p PV installation and a 50 m^2 solar thermal installation on the roof, as well as heat pumps. The heat pumps use sewage water from private households as the primary energy source for heating and cooling in combination with the 1250 m^3 sprinkler tank serving as a thermal storage and buffer.

10. https://news.energysage.com/an-overview-of-the-california-solar-mandate/

FIGURE 3
Typical solar PV generation and battery charging/discharging schedule



Source: Fitzgerald et al., 2015

Part 2.

Unlocking the potential of on-site renewable electricity generation and storage

To reap the full value of on-site renewable electricity generation and behind-the-meter storage, we need to address several roadblocks that still stand in the way.

To argue for the right framework for on-site/near-site renewable electricity generation and storage we need to answer the question: How does EU regulation need to change and what barriers should be removed? To answer this question, we provide an overview of the barriers and challenges in some EU Member States related to on-site renewable electricity generation and behind-the-meter storage. In the last section of this report, we provide recommendations for a European regulatory framework to be fit for the future for C&I self-consumption.

To remove these barriers - which can be regulatory, technical, political, and administrative - it is crucial to investigate concrete proposals to develop the right framework.

The right framework should **ensure efficiency** and therefore avoid distorting the level-playing field between on-site and off-site grid-connected generation, as otherwise maximising the efficiency of renewable generation – installing the generation plant anywhere in Europe where the sun shines the most or the wind blows the most – could be outcompeted by less efficient renewable generation that utilises local resources[10]. The right framework would also ensure efficiency through a more efficient use of spaces, facilitating the possibility to cover buildings and parking spaces with solar installations.

The right framework should **ensure fairness** and therefore guarantee that the cost of the energy transition to a carbon neutral future remains well-distributed and that electricity consumers are not exposed to disproportionate charges.

The right framework should **ensure robustness** and therefore be stable over a long time period without hindering innovation (i.e., be future-proofed) and be fit for small and large consumers.

IKEA, Adelaide
© IKEA

11. Caveat: when talking about system efficiency, generating in the location with the highest electricity yield may not always be the most efficient option in terms of constraints of interconnector capacity and transmission losses.

Identification of challenges and barriers faced by industrial and commercial energy consumers

To unlock the large potential for on-site generation, first we need to address the challenges and barriers that remain along the way. Below we provide a balanced overview of such challenges and barriers across EU Member States:

Need for robust and predictable planning and frameworks

The following points outline the challenges which highlight the need for robust and predictable planning frameworks:

Lack of an enabling framework for C&I prosumers

- The Renewable Energy Directive (RED II) 2018 states that Member States shall ensure that renewables self-consumers are not subject to discriminatory and disproportionate procedures and charges, and to network charges that are not cost-reflective, in relation to the electricity that they consume from or feed into the grid. The reality is a bit different and several Member States still apply disproportionate administrative procedures for C&I self-consumers. For example, in France, on-site self-consumption above 100 KW (the C&I installations typically range from 100 KW to 1 MW) was awarded through a tendering scheme for solar installations, which presented too high of a risk for corporate buyers. The result has been an under subscription in the last tenders and a low development of C&I self-consumption.

- Some Members States do not have an enabling framework for C&I prosumers in their National Energy and Climate Plans (NECPs). Such enabling framework could entail, for instance, access to information, access to cost-competitive financing, and appropriate measures that would facilitate the development of "medium-sized" renewable installations. Such installations fall under a regulatory "grey area" in the current EU framework, which defines specific provisions for installations under 30 KW and above 1 MW but do not address the characteristics of C&I self-consumption installations, which are commonly medium-sized.

- Regulatory uncertainties for self-generation also differ from country to country, related to the interpretation of complex legal provisions, changes in support schemes, and changes in energy taxation and network costs. For example, Poland set up a scheme that benefited prosumers based on a net billing system; however, the country experienced retroactive changes in the framework for renewable energy policies, leading to a lack of confidence in the market for investors.

Lack of visibility of national prosumer strategies

- As shown in the EU Member States' NECPs, only 5 countries have targets for prosumers (AT, FR, HR, HL, HU), 3 countries have targets for prosumers in public buildings (BE, LU, ES), and 6 countries have trajectories for prosumer development (CZ, EE, IT, LT, PL, RO). With visible and well-communicated national prosumer strategies, it would help to plan for investments since it would indicate how much self-consumption is expected by a certain year.

Lack of an enabling framework for collective self-consumption

- Collective self-consumption can allow a range of consumers to access self-consumption and develop new projects using the synergies between consumption and production. Collective self-consumption is only possible in 12 EU countries and will be implemented in other 4. Only 9 countries allow collective self-consumption beyond the borders of buildings (including two under development: Belgium and Italy).

- In countries where it is allowed, the schemes may not be well developed. For instance, in Germany, the Mieterstrom system has been pioneering the concept of collective self-consumption, yet it shows its limits: (i) The scheme is limited in scope since it is only available to <100 KW systems, excluding a portion of C&I systems (those with installed capacities between 100 KW and 1 MW), and is possible only for tenants living in the same building and for buildings serving primarily for housing and accommodation.

Lack of right implementation of Clean Energy Package provisions for storage

- The Clean Energy Package introduces the right policy framework that only needs to be implemented appropriately to overcome existing barriers on storage. One such barrier is double taxation. Storage, defined as electricity in and electricity out at a later point in time, should not be treated as end-consumption. For this reason, taxes/levies charged on end-consumption should not be charged to storage. Removing double charges on storage would place these technologies at a necessary level playing field with generation technologies.

Lack of development of grid connection and integration frameworks

- Permit-granting procedures are a major barrier to the development of renewable installations in Europe. Procedures are too complex, require reaching out to too many contact points and are very lengthy. This results in delays for the project realisation, and in higher related project development costs. It also impacts the perceived risk for projects, and thus the cost of capital.

- The development of a smart, decentralised grid built around prosumers will be critical in the coming years. Depending on the country, the grid can pose a barrier to the development of prosumers. For example, in the Netherlands, the development of prosumer schemes has been slowed down by grid operators, due to a lack of capacity in the distribution grid. The result is serious delays in the connection of projects, even putting at risk prosumers having access to their support schemes.

Lack of an enabling framework for corporate renewable sourcing

- The Clean Energy Package has been a positive step in promoting corporate renewable sourcing and establishing explicit requirements for the removal of administrative and regulatory barriers to corporate renewable power purchase agreements (PPAs). However, most of the Member States have ignored these provisions in their NECPs, while corporate buyers will have to intensify their efforts to achieve the ambitious objectives of the European Green Deal. An example of such barriers in found Poland, where due to the regulatory reasons, corporate renewable energy PPA on-site with third party investor are not allowed, so alternative models like leasing were the preferred choice.

- Guarantees of Origin (GOs) are meant to demonstrate the use of renewable electricity by an electricity consumer. Therefore, a well-functioning framework for GOs is critical to the development of corporate renewable PPAs. However, in countries like Poland, Spain, and Italy, GOs cannot be assigned for self-consumption/behind-the-meter projects, only for the electricity that it is injected into the grid and then exported. This creates challenges for renewable energy buyers as they may want to make claims against renewable energy goals.

Need to increase simplicity of customer journey

The following points outline the challenges which highlight the need for higher simplicity in the customer journey:

Lack of a consistent approach in permitting

- The permits and paperwork required to install renewable energy units on-site and behind-the-meter batteries differ between regions and municipalities, exacerbated by the variations in incentives. This slows the industry down massively and makes the customer acquisition and installation process more expensive for companies and, in the end, for corporate's customers.

Lengthy and cumbersome administrative procedures

- In Germany, becoming a prosumer with storage requires filing a series of 30-page forms with the DSOs. A certain number of documents must be uploaded on the DSO / TSO website, which cannot cope with the volume of documents. Consequently, only one active customer can be registered per day. This translates into 20 active customers per month. A more agile process is needed.

- Similar difficulties may face prosumers in the Czech Republic, where paperwork is relatively extensive. In most of the cases, this is taken care of by the system provider.

- In Poland, as per the Renewable Energy Act, renewable energy installations with capacity >500 KW require a generation license, placing an additional administrative burden on the investment process. For this reason, many investors reduce their installation to <500 KW even if a larger installation is possible, discouraging the installation of on-site renewable electricity generation capacities >500 KW. It appears the limit will be raised to 1 MW in the coming legislation changes.

- Also in Poland, the time required to obtain connection conditions for installations with capacity over 50 KW from the local distribution network operator is currently up to 120 days as of September 2020 (for comparison, installations up to 50 KW are connected within 1 month). Considering the connection conditions and other permits required, the overall investment process can take at least a year. This significantly increases project development time and discourages many investors as well as renewable energy providers from participating in such projects due to cashflow issues.

Lack of a consistent approach in issuing incentives

- A customer in Austria is exposed to a combination of national, regional and municipality rules and incentives. In some cases, the validity period is very short due to small assigned budgets. In many cases these cannot be combined, and, in other cases, they can be. Therefore, it is difficult for customers as well as for the industry to keep track of the best combination of incentives.

Need to increase awareness of business model options

The following point outlines the challenges which highlight the need for increasing the awareness of business model options:

Limited awareness of the different business models

- In particular, Small and Medium Enterprises may have a limited awareness of different business models for self-consumption available to them. This represents an obstacle to investments in self-generation and to the use of on-site renewables via third-party financing.

Need for a fair customer pay-back

The following point outlines the challenges which highlight the need for a fair customer pay back:

Lack of appropriate allowance for self-consumption without negative financial consequences

In the Czech Republic, a prosumer scheme has been in place but the government has announced that it will review retroactively the Internal Rate of Return (IRR) of the scheme and lower it to 6.3% for solar (against 7% for wind, 9.5% for biomass, and 10.6% for biogas). This will lower the incentives for prosumers to invest. Also, in the Czech Republic, excess electricity can only be sold to the company that one has signed up to buy electricity from.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Common on-site business models for industrial and commercial energy consumers

There are two common on-site business models available to corporates: ownership and power purchase agreement (PPA)/Lease.

On-site generation of renewable energy is regarded as having the highest visibility of the options available for corporate renewable electricity sourcing. Therefore, corporates may want to make sure that they maximise the on-site solar footprint as fast as possible across sites and geographies. The most traditional structure is direct investment, or ownership. A commercial or industrial buyer will pay a developer or an Engineering, Procurement, Construction (EPC) contractor to build an energy installation on their site. There are several financing mechanisms which can be used to purchase the system, with the "cash option" being the most common. Corporates interested in mitigating the near-term financial impacts of investment may use bank loans to increase short term liquidity and pay for the installations from the savings.

If solar or wind energy is not the core business for a business, then they may choose to close a PPA with a project developer. Through the PPA, the responsibility of design, installation and operations and associated risks are transferred to the supplier. There are no upfront costs associated with this model.

The common on-site business models have their own benefits and challenges which, before the company decides on a certain strategy, should be considered in relation to the company's needs, capabilities, and ambitions.

In the next section we explore the dominant on-site business models that can empower energy consumers – companies, communities, and individuals – to become renewable energy prosumers, through turning buildings into renewable energy power stations.

	Ownership	PPA/Lease
⊕	Once the system is built, the buyer owns the solar asset and the electricity it produces Full control and accountability over technical, operational, legal, financial, and sustainability aspects. Similar decision process to other "capex investments". Also, could own an installation and a third party looks after the operations and maintenance Investment repaid through generated electricity	No upfront cost or down payment for the corporate buyer (or the buyer's landlord, if the facility is leased) The corporate only pays for the electricity that is produced, and at a predetermined rate – savings since day 1 Allocates workload and operational risk to the supplier
⊖	High upfront costs financed directly or through short-term loans to install the system. Longer-term obligations to effectively operate and maintain the asset Requires the corporate to assume and manage all the risks associated with direct ownership, e.g. technical, operational, legal, financial, and potential complexity to manage suppliers over the lifetime of the project and asset	For some companies it may lead to time-consuming contract negotiations and management Accounting principles need to reflect the value of a lease contract in the profit and loss (P&L) statement – a potential barrier for on-site models

Business Models – "Owner"

1. Individual self-consumption

Individual self-consumption refers to consuming on the spot all or part of the electricity produced in the same building where the electricity is produced. There may be no need to use the grid or to use the grid as a back-up provider. Self-consumption of electricity generated on-site can be an opportunity for consumers to reduce their electricity costs, grid charges and other fees for electricity supply. Excess electricity can also be sold to a third party. Application segments include C&I consumers that want to showcase leadership on renewable energy and/or avoid high electricity prices on the electricity grid.

Take away	Offsetting consumption at on-site location
Examples in	Across Europe

Case study: IKEA

IKEA's new store in Gothenburg (Kållered) will be the first IKEA store with on-site generation in Sweden. It is expected to be the most energy efficient IKEA store in the world, with energy efficient solutions, such as a smart energy system, combining solar panels on the roof and ground source heat pumps, with an expected energy use of 54 KWh/m^2 (18 KWh/m^2 for the energy system alone). The solar panels on-site produce more than 900 MWh per year, enough to completely power the heating and cooling for the store. The on-site generation amounts to more than 40% of the expected consumption of the store, this is a very significant share considering the northern location of the store.

IKEA, Kållered
© IKEA

Case study: IKEA

IKEA announced its first renewable energy positive store, which aims to generate more renewable energy than it consumes and to support the local grid. This will be done by covering the roof and parking areas with solar panels and installing an on-site storage solution which will support the South Australian power grid. Surplus electricity will be injected into the South Australian network when demand is at its highest. Electric vehicle chargers will be installed on-site for customers, co-workers, and the IKEA delivery fleet. This is the latest initiative on Ingka Group's journey towards becoming climate positive by 2030.

The IKEA Australia Clean Energy Transformation Project will help achieve three goals in its sustainability agenda including:

- Being powered by 100% renewable energy
- Transitioning the delivery fleet to 100% zero-emissions
- Inspiring their customers in joining a clean energy movement.

"Our ambition is to be the first mover and inspire other IKEA stores to install larger solar installations, batteries and digital solutions. Planet Ark Power's eleXsys energy management system will support the balancing of the electricity grid not just on stores in Australia, but across the IKEA network around the world," says Jan Gardberg, CEO and Chief Sustainability Officer, IKEA Australia.

"Collaborations like this have always been a cornerstone of the IKEA way – this is more important now than ever to tackle the climate crisis. Change will only come if we work together. We are convinced that climate action drives innovation and development. IKEA Australia is taking action together with our customers, partners and governments to do our part in creating a society powered by 100% renewable energy," says Karol Gobczyński, Global Head of Climate & Energy, Ingka Group.

IKEA, Adelaide
© IKEA

Case study: Volvo Ghent

This plant was the first solar PV installation on Volvo's global manufacturing operations. The installation of 15,000 solar panels on the roof of Volvo's factory in Ghent is part of the company's efforts towards climate-neutral global manufacturing operations by 2025. The PV installation will supply 5% of the plant's power needs and save the company 200,000 EUR/year on its energy bills.

The plant already uses wind power for 11% of its demand. To help finance the PV installation, Volvo offered its 6,000 employees the opportunity to invest in the scheme. This took the form of a so-called crowd-lending in which the employees lent money to start the project. The company has also installed a heating network at the site.

© Volvo Ghent, Belgium

2. Collective self-consumption

Self-consumption can also involve a plurality of consumers located in the same building, the same street, or even in the same neighbourhood, which takes the name of collective self-consumption or jointly acting self-consumers, and its scale depends on the scale allowed by the Member State.

Collective self-consumption is an effective option for accelerating the energy transition as collective projects can be effective in empowering local actors through ownership of electricity production capacity and social ties. Collective self-consumption is interesting for businesses since sharing an installation reduces the cost per KWh and increases the rate of self-consumption by adding together the different demand and production curves from the local actors, which can be local stores from the same company. By adopting this model, business can also show their environmental and social commitment to customers. The income is generated through avoided electricity costs as well as net-metering, net billing and feed-in schemes, if available (see section Supporting the uptake of on-site renewable electricity generation with financial incentives for more details), which enable payments from the utility or the government for generation and/or export of electricity.

Take away	Offsetting consumption at on-site location and nearby the facilities
Examples in	France, Spain

In France, the perimeter that defines collective self-consumption is not being in the same postcode area but within a circle with a 1-Km radius. Loi Pacte allowed experimenting on the maximum collective self-consumption perimeter.

In Spain, the collective self-consumption model is allowed when the connection between the production facility and the points of consumption is either: a) an internal (home) network or direct line; b) a low voltage network derived from the same substation; c) the facilities and the substation are less than 500 metres apart or d) are located in the same property registry according to their first 14 digits.

In Switzerland, a self-consumption models allows for several houses or businesses to come together and create a self-consumption consortium. This consortium can be made up of owner-occupied residential units or landlords that act on behalf of their tenants if the participating properties are adjacent to one another –or in a multi-occupancy building. There must be only one grid connection point between the consortium and the grid. A limiting number of suppliers per metering point might be a barrier for unlocking the potential of this model, and it might be necessary to remove such restrictions or increase the number of suppliers per metering point.

More efficient self-consumption – being part of an energy community

In Italy, the government has introduced measures allowing **businesses**, households, and public entities to invest in, generate, and trade renewable electricity in low-voltage grids. The new framework is open to projects with a generation capacity no larger than 200 KW and they can include electricity storage. The new rules were conceived to enable a **more efficient model for self-consumption**, as they allow for the best location for a renewable electricity generator within a low-voltage grid and to bring power to all of the entities connected to that grid. The electricity generated by community energy members should however be consumed immediately or stored, it cannot be fed back into the wider electricity network. Installations operating under the community energy provisions will not be entitled to net metering payments for any excess electricity fed back into the grid, yet owners will qualify for the personal income tax deduction available to renewable installations under the sustainable building reforms.

Business Models – "Buyer"

In addition to the option of owning the energy asset, if a corporate does not have the capacity or willingness to mobilise investment and to self-invest, then there are other options that a company can rely on. Tapping into the potential of models that do not require upfront costs or down payment for the corporate energy buyer can greatly contribute to transition from 100 to 100,000 companies consuming renewable energy.

1. On-site Power Purchase Agreements

A third party builds, owns, operates, and maintains the renewable energy installation on-site. The electricity generated by the renewable energy installation is consumed by the corporate, which can secure a long-term fixed price for the electricity through a Power Purchase Agreement (PPA). The PPA electricity supply price will depend on the characteristics of the renewable energy plant and the retail price of the electricity.

Take away	A third party builds, owns, operates, and maintains the plant, and the corporate consumes the generated electricity
Examples in	Spain, Portugal, the Flemish part of Belgium, Italy, France, among others

Case study: Decathlon

Decathlon uses the on-site PPAs model in several countries like Spain, Portugal, the Flemish part of Belgium, Italy, and France. The contracts are typically signed for periods of 10 to 20 years. Decathlon uses the fixed price with indexation structure, which on average is 25% cheaper than market price. Depending on the price paid, Decathlon may inject the generated electricity into the electricity grid.

Decathlon Maasmechelen
© Decathlon

Case study: Alecta

A PPA model with third-party investors proved irresistible for a global property owner. Alecta conducted research on how to reduce their properties' carbon footprint and concluded that a solar PPA model with Alight was the preferred solution for their retail parks, shopping malls, grocery stores and hotels. In total the firm signed six different on-site PPAs with solar, which reduced the firm's CO_2 emissions by 103 tonnes within the first year and a half of operation.

Alight's solar energy installation at Alecta's property in Värmdö, Sweden

Case study: Järfälla

Looking beyond one's own facilities, a solar PPA model combined with a centralised tender was used in Järfälla municipality in Sweden, a municipality that aims to be a frontrunner in sustainability. Their goal is to run 100% on renewable energy by 2025, including the deployment of at least 1 MW of solar power. To reach that target, Järfälla chose to launch Sweden's first public solar PPA tender process in 2017, including 10 PV systems on the rooftops of schools and residential homes. Tenderers submitted one PPA price covering all sites and the winning bid from Alight was below grid cost. Choosing the PPA model combined with a centralised tender approach allowed Järfälla to make significant progress towards their renewable energy target 6 years ahead of schedule while using the intended CAPEX budget elsewhere and creating savings from day one.

"We had a clear goal. To install 1 MW of solar power before 2025. We were thinking about how we would best make it happen. The strongest argument for PPA was the financial aspect. The solar electricity costs less than from the grid. I am absolutely proud of what we have succeeded in doing."

Head of Facility Maintenance, 2017

Case study: a.p.l. - architekten

A PPA for a building's façade

In Marburg, Germany, a 50 KW PV system with monocrystalline solar modules is being built on the façade of a radiology centre. The Marburg municipal utilities and the Sonneninitiative association concluded a long-term PPA that ensures the financing of the project by means of long-term electricity supply from the association's investors to Stadtwerke Marburg through a cost-covering remuneration. Stadtwerke Marburg will refinance the costs for the PPA through the sale of the solar power to the radiological practice in the building, which has a very high electricity consumption due to its devices.

This project shows how all available areas can be used for electricity generation, without disrupting urban aesthetics.

a.p.l. - architekten, Hagen Plaehn

2. Leasing

A third party owns the on-site renewable energy installation and leases it with a fixed monthly/annual leasing fee. The installation is owned and managed by an organisation with the experience and knowledge to develop and maintain it. The leasing fee is unrelated to the volume of power generated. Installations are usually sized to achieve very high or near 100% self-consumption. If there is a grid connection, excess power can be sold into the wholesale market.

Take away	A third party leases the plant, and the corporate consumes the generated electricity
Examples in	All around Europe

For corporates to put citizens at the centre of an inclusive and just energy transition, they need to engage in a community process that is equitable, transparent, and consultative, and show they are willing to understand the demands of the public at large. For example, it is important for the corporate to engage with the local community to obtain planning consent and to carry out an assessment of the visual impact, and its potential effect on the community and the surrounding environment.

Case study: Decathlon

Decathlon uses the leasing model in markets where the project developer cannot sell electricity from the energy installation to Decathlon because the local regulatory framework does not allow it. Decathlon uses this model in France and the French-speaking part of Belgium. The model comprises a fixed fee for renting the installation between 10-20 years.

Decathlon Avignon
© Decathlon

3. Private-wire PPA

The renewable installation is located on land adjacent or near to the C&I consumer and the two are connected via a purpose-built direct or "private" wire. The costs of building the private wire are incorporated into the costs of the project and hence into the PPA price. The land can be owned or rented from either the corporate power consumer or a third party. The private wire connects behind the meter, so this model does not use the public grid. This means it avoids non-commodity grid costs (i.e. charges incorporated into electricity bills which come from the government or other third parties) which are expensive and increasing over time.

A connection to the grid at the installation site may be required to manage excess electricity and to make the installation more secure on its own. The costs of the connections should be included in the overall project economics. If there is no grid connection, the system will need to rely on an energy storage system to secure electricity supply.

Take away	The corporate consumes the generated electricity from a renewable installation located on land adjacent
Examples in	United Kingdom

Case study: Shotwick

Shotwick solar farm is the largest private wire solar park in Europe. It covers an area of just under 250 acres (1 km^2) and supplies one third of the paper mill's annual electricity demand. UPM-Kymmene is also saving over 200,000 tonnes of CO_2 every year thanks to the project. A direct power supply contract with UPMKymmene's Shotton Paper Mill provides up to 100% green energy in daylight hours. UPM-Kymmene is a Finnish forest materials company, formerly United Paper Mills. The private wire solar project is also connected to the grid and thus has the flexibility to export the electricity surplus to the grid. This represents an attractive arrangement for both the solar park and UPM as a major local employer, as it delivers long-term environmental and economic benefits to the local community.

Ref: https://welink.eu/paper-mill-run-clean-power-welink-group-completes-sale-uks-largest-solar-park-foresight-solar-fund/

Supporting the uptake of on-site renewable electricity generation with financial incentives

1. Feed-in tariff

Feed-in tariffs (FITs) consists of a fixed rate, set at a national level by the government, at which any individual can sell electricity produced to the grid. FITs are usually contracted for a defined period from the plant's commissioning, typically 20 years. There is a trend towards moving away from FITs to self-consumption, enabling building owners to consume their green power themselves and, if the generation assets are coupled with batteries, providing for additional benefits for their own operations and the grid.

Take away	Incentivises prosumers to deploy on-site renewable electricity generation
Examples in	Austria

In **Austria**, there are feed-in-tariffs (FiT) contracts available for PV systems with a capacity between 5 KW and 200 KW for a duration of 13 years. The rate is updated yearly on a downward trend. Since C&I solar installations typically range from 100 KW to 1 MW, this mechanism opens the door to directly support renewable energy installations in C&I applications. The government is currently discussing the revision of the FiT scheme.

2. Net metering and virtual net metering schemes

If the electricity generation system produces more electricity than required, then connection to the grid and net metering rules can ensure that the excess electricity is rewarded. This motivates consumers to become prosumers and helps them to save on their electricity bill.

To encourage private and corporate consumers to invest in renewable energy, it is important that policy mechanisms allowing for reduced electricity bills are clearly defined. Beyond net metering, here we also highlight two examples of "virtual net metering", which is an adaptation of a regular net metering scheme but for customers that, for technical or economic reasons, cannot reap the benefits of an on-site renewable energy installation. All virtual net metering self-consumers across multiple sites net against each other.

Take away	Incentivises prosumers to deploy on-site renewable electricity generation
Examples in	Poland, Lithuania, Greece

Poland allows for partial net-metering, where prosumers are compensated for excess electricity exported to the grid at 80% of the rate at which they buy electricity from it.

Lithuania allows for virtual net metering, which opens the possibility to construct renewable electricity generators in one part of the country and consume its electricity in another. Under this new legislation, implemented in 2019, the virtual net metering system can be applied to PV installations up to 500 KW and can be used by every legal or personal entity, such as private households, commercial units, communities, etc. That means, for instance, that a family can install a PV system in their summer house and be credited for the solar at their primary residence.

In **Greece**, a virtual net metering scheme was introduced in 2016. The scheme followed an annual cycle: each time the electricity retailer issued an electricity bill, the retailer measured both the electricity fed into the grid and the electricity consumed by the customer.

If the difference was positive, i.e. more electricity was produced and fed into the grid than consumed, then the surplus was credited to the customer's next electricity bill. However, any surpluses after the end of the year were not compensated by the electricity provider to the self-producing electricity consumer and were cancelled. In 2017, the government introduced a new but very similar virtual net metering scheme, which follows a three-year instead of a one-year cycle: after connecting the renewable energy generator to the grid, every three years, the electricity surplus is set to zero and is not credited in the next bill.

The virtual net metering scheme in Greece allows for a maximum solar PV installed capacity of 20 KW_p or up to 50% of the sum contracted capacities if this value is greater than the 20 KW_p. Grid-connected wind farms up to 50 KW are also eligible. Both production and consumption should be at the same voltage level.

The Clean Energy Package includes provisions not to have new net metering mechanisms past 2023. While net metering schemes are meant to support the deployment of renewable energy generation, they do not provide the right business case for deployment of batteries. Several European countries that still use this scheme have plans to phase it out, for example, in Flanders, Belgium, net metering has already been phased out. In 2022, the Belgian government is planning to introduce capacity tariffs, injection taxes and dynamic price contracts.

3. Net billing schemes

Both net metering and net billing schemes allow for automatic balancing of electricity injected into the grid and consumed from the grid. The last, however, aims to address the limitations of the former: the compensation mechanism under net metering does not reflect the cost of electricity at the moment of injection and may distort the market if the quantity injected is significant.

Net billing is a market-based compensation mechanism that incentivises prosumers to better interact with the grid. Net billing schemes incentivise demand-side flexibility and maximise the benefits for consumers when renewable energy assets are coupled with behind-the-meter batteries, since the scheme provides an additional remuneration to prosumers when the stored electricity is released into the grid when the remuneration for that electricity is high.

The prosumer obtains an economic compensation based on the actual market value of electricity, balancing what they consume against what they inject into the grid. Prosumers can inject excess electricity into the grid when the electricity is more valuable to the system: during peak load hours instead of off-peak hours. Another advantage of net billing is that under net metering schemes, certain costs included in the retail tariffs, such as grid access costs, supply costs and balancing costs, are not subtracted from the compensation to consumers.

Instead, net billing schemes are a compensation mechanism that captures the value of renewable electricity at the time of injection into the grid and at the wholesale electricity market price.

Take away	Incentivises prosumers to couple renewable electricity generation with behind-the-meter batteries and better interact with the grid
Examples in	Portugal, Norway, Italy

In **Portugal**, surplus production injected into the grid is bought by the electricity supplier at a rate which amounts at 90% of the wholesale electricity price on the hourly spot market.

In **Norway**, the electricity retailers are entitled to buy excess electricity from prosumers at the wholesale electricity rate, based on the hourly spot market.

In **Italy**, through the "Scambio sul Posto", prosumers receive economic compensation from electricity fed into the grid, yet net billing only covers parts of the charges and duties that are included in the retail electricity price. The scheme can be combined with tax deductions (see next section) and is limited to an installed capacity of 500 KW_p.

4. Incentive schemes for self-consumption

One of the most effective ways to increase deployment of on-site renewable electricity generation will be to adapt current incentive schemes to acknowledge the intrinsic characteristics of C&I consumers. For example, to acknowledge that installation sizes typically fall between 100 KW and 1 MW.

It will also help to remove discriminatory taxes and charges on self-consumed electricity, a historical deterrent to wider adoption. Some countries are now taking measures to provide better tax benefits and third-party financing schemes for self-consumption.

Take away	Easy to implement and direct and fast impact
Examples in	Sweden, France, Spain

In **Sweden**, prosumers with systems up to 500 KW will be exempted from paying taxes on self-consumed electricity as of 1 January 2021. Currently, the size limit is 255 KW. Increasing the threshold will benefit prosumers with larger commercial systems, which will also bring better economies of scale.

In **France**, prosumers benefit from a fee exemption on self-consumed electricity for installations with a capacity up to 1 MW when the electricity is injected into the grid. The exemption also applies to installations generating up to 240 GWh when electricity is fully consumed on-site, even when the solar installation is owned by a third party under a leasing or rental contract. Exemption will enable prosumers to pursue innovative business models since it allows professionals to propose new commercial offers while having the certainty that their customers will not be liable for taxes on renewable energy. Previously, when doing due diligence for a self-consumption project, there was concern when the facility belonged to a third party that the consumer would be indebted for the tax on the final consumption of electricity (Taxe Intérieure sur la Consommation Finale d'Electricité, TICFE).

In **Spain**, some municipalities grant temporal property tax bonifications to C&I buildings with solar PV installations.

5. Green certificates for on-site renewable electricity generation

Non-fiscal measures such as green certificates also contribute to support the uptake of on-site renewable electricity generation.

Take away	Medium difficulty to implement, and direct and fast impact
Examples in	Belgium

In **Belgium**, electricity from renewable sources is promoted mainly through a quota system based on the trade of green certificates. The number of certificates depends on the amount of electricity generated (in KWh) in proportion with the CO_2 saved: one certificate is issued for every 217 kg of CO_2 saved. The renewable electricity producers obtain green certificates for their production, and the federal grid operator purchases green certificates at a minimum price set by law for certain renewable electricity generation technologies and a predetermined number of green certificates. This quota differs depending on the region: Wallonia, Flanders, Brussels-Capital. In the Brussels-Capital region, for example, the production of renewable electricity is promoted through the federal system of green certificates as well as through regional support schemes such as investment assistance for companies and net metering.

Supporting the uptake of behind-the-meter batteries with financial incentives

1. Direct financial incentives for end consumers to couple on-site renewable electricity generation with storage

The fastest route to increasing storage deployment may be cash subsidies (€/KWh) to end consumers. This mechanism incentivises customers to add battery storage as they benefit from a reduction in the up-front costs of the storage installation. This support mechanism has two benefits: 1) it increases self-consumption rates and 2) helps to increase local grid stability and flexibility.

Take away	Easy to implement, effective, delivers flexibility to the grid
Examples in	Austria, Germany (Bavaria, Nordrhein-Westfalen)

Flat subsidies directly in € instead of € per KWh have proven ineffective as they incentivise adding electricity storage with sub-optimal capacity.

In March 2020, the **Austrian** government launched a €36 million rebate program for small solar-plus-storage installations, with a third of that amount subsidising storage. The scheme offers homeowners €250 per KWh of solar rooftop generation capacity and €200 per KWh of storage. Solar systems with a capacity of up to 500 KW can apply for the rebate, alongside storage units of up to 50 KWh. Larger systems can be installed but the rebate will only apply up to those limits. The Austrian solar association estimates that the €36 million rebate program will result in 100 MW of additional solar capacity and 60 MWh of storage.

In **Germany**, the southern state of Bavaria adopted a subsidy scheme for residential solar-plus-storage that provides €500 for a storage system of at least 3 KWh and a further €100 for each additional 1 KWh up to a maximum of €3,200. With this scheme, the state hopes to delay the need for grid reinforcement. Further north, the state of North Rhine-Westphalia provides €200 per KWh when installing an electricity battery storage system in conjunction with a new solar system. A condition is that the storage capacity (in KWh) must not exceed twice the installed capacity of the solar system (in KW_p). Private individuals, freelancers, companies (particularly SMEs) and municipalities are eligible for funding.

2. Tax deductions for end consumers with battery storage

Another measure is to incentivise end consumers with a tax deduction, by qualifying storage as a technology with tax advantages. By doing so, commercial users can deduct the investment of an electricity storage system from their tax obligations by a certain percentage of their corporate tax. This mechanism reduces administrative work for the government and the building owner because it is not necessary to set up a separate grant application system.

Take away	Easy to implement, effective, delivers flexibility to the grid
Examples in	The Netherlands

The Netherlands, through the Energy Investment Allowance (EIA), allows companies that invest in energy-saving installations or that use sustainable energy to deduct a certain percentage of the invested sum from their taxable profits from the year in which the goods are purchased. It covers investments in solar panels and storage that contribute to electricity balancing. Companies can deduct 45% of the investment costs from taxable profit.

3. Grants for renovations and efficiency measures when installing battery storage

Commercial energy consumers can benefit from renovation grants to promote the adoption of efficiency measures in buildings. The adoption of storage systems is a proven measure to increase system efficiency. For example, the combination of solar PV with storage can help increase the self-consumption rate from approximately 30% to 70% with added system benefits, such as reducing network and system costs.

Take away	Medium complexity to implement
Examples in	Italy

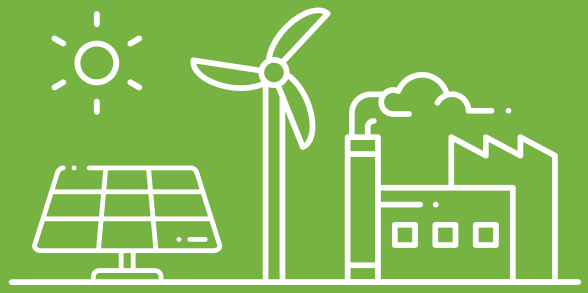
Italy has raised the tax deduction for solar PV installations and storage systems from 50% to 110%, the so-called super eco-bonus, effectively enabling homeowners to install PV systems at no cost. The eco-bonus applies to three types of renovation projects: 1) building insulation, 2) the replacement of cooling and heating systems in apartment buildings, and 3) the replacement of cooling and heating systems in family homes.

All PV systems or solar-plus-storage systems installed with the 110% tax break will be allowed to inject surplus power into the grid, although not under the net metering regime ("Scambio sul posto"). This means that surpluses will be given to the Italian energy agency Gestore dei Servizi Energetici (GSE) for free, and that sizing systems with high self-consumption rates may be more profitable options.

The new scheme will generate €6 billion in construction work, leverage total economic benefits of €21 billion across Italy, create 100,000 new jobs, and improve living conditions for millions while putting energy savings back in their pockets (ref: economic modelling by ANCE, the Italian Association of Construction Companies).

Before the government implemented this measure, there was a 50% eco-bonus tax deduction which, together with the "Scambio sul posto", were the main drivers for solar energy development in Italy over the past few years. Today, solar and storage systems that will be realised but not connected to building insulation projects or to the substitution of heating systems, will still benefit from the previous 50% eco-bonus.

Policy recommendations



Businesses can meet their greenhouse gas emissions reduction commitments, and even achieve net-zero emissions, by leveraging the potential for generating and storing renewable electricity on-site, if the right enabling framework is in place. A strong legislative framework that is fit for the future would enable businesses to play a more important role in meeting EU and national renewable energy targets.

A European regulatory framework fit for the future for commercial and industrial on-site renewable electricity generation and storage

1. Policies should be stable and predictable for businesses

- **Develop long-term national prosumer strategies.** Visible, well-communicated, and stable national prosumer strategies would help plan for investments in renewable energy and storage for C&I prosumers, for example by indicating how much self-consumption is expected by a certain year. These plans should be underpinned by data on the suitability of the building stock to integrate renewable energy, allowing building owners, investors, and policymakers to assess the on-site renewable energy potential of buildings.

Example

in France, the Law n° 2019-1147 on Energy and Climate provides clear signals for C&I prosumers, stating that new warehouses, supermarkets, and parking lot shade structures, will be required to have solar panels on at least 30% of their surface.

- **Support medium-sized on-site renewable energy installations**. Medium-sized installations fall under a regulatory "grey area" in the current European framework, which defines specific provisions for installations <30 KW and >1 MW but do not address the characteristics of C&I self-consumption installations, which are commonly medium-sized. Such installations would benefit from stable and predictable support to innovative business models.

Examples of specific support

- Remove restrictions on third-party ownership of on-site renewable installations
- Allow for project developers that are different from the energy supplier.
- Allow C&I self-consumers to self-supply their facilities through a direct line.
- Provide adapted simplified administrative procedures.

- **Allow the assignment of GOs for C&I self-consumption installations**. This is, however, not possible in some countries like Poland, Italy, and Spain.

Example

It would be in the Member States' interest to assign GOs for C&I self-consumption projects, since it would help businesses in their efforts to:

- Track and report their renewable energy claims for compliance purposes, in particular in a sector coupling perspective, since in the future, frameworks would allow a company to value the fact that its charging points for electric vehicles are charged with locally produced solar power – and such frameworks are being developed.
- Encourage self-consumption in C&I actors.
- Help Member States advance their renewable energy and climate targets.

2. Policies should support a smooth customer journey, making it easy for businesses to invest in renewables

- **Reserve tendering schemes for on-site renewable energy installations with a capacity high enough to allow C&I installations to grow, e.g. above 500 KW.** To facilitate the deployment of on-site renewable energy installations in business, they would benefit from better fit-for-purpose tendering schemes.

Example

In France, on-site self-consumption above 100 KW was awarded through a tendering scheme for solar installations. Being part of a tendering schemes might be a highly complex process for some companies, and therefore the tendering scheme resulted in an under-subscription and thus a low development of C&I self-consumption. The government announced it would increase the threshold to 500 KW to better reflect the needs of businesses and avoid the requirement for installations below that size to go through a dedicated tendering process.

Instead, in Germany, as part of the revision of the EEG law (Erneuebare Energien Gesetz), the government proposed to decrease the threshold for tenders from 750 KW to 100 KW, which could drastically reduce the installed capacity in that segment.

- **Accelerate and simplify permit-granting and grid connection procedures.** Member States should facilitate the deployment of storage and on-site renewable energy installations and their connection to the electricity grid, while maintaining environmental standards. This should be explicitly required in the NECPs. Simpler administrative procedures would shorten the processing period, resulting in notably lower all-in costs for energy developers and customers.

Example

- Reducing the time required to obtain connection from grid operators would shorten the project development period for new installations, reducing the administrative burden and therefore reducing the cost passed on producers and consumers. This measure would encourage more energy developers to participate in the market and thereby create benefit for investors.
- The lack of simplification of the authorisation procedure for renewable energy projects is an important issue in Italy that has delayed the deployment of new renewable installations. Providing a size-limited “generation license” for medium-size C&I installations would encourage more investors to install bigger installations, increasing renewable electricity’s market share.

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3. Policies should support an easy and financially favourable ownership model

- **Define simple and fair remuneration of excess electricity injected into the grid for C&I prosumers.**

Example

In Spain, surplus electricity compensation is only allowed for installations <100 KW. The paperwork is easier for a "zero-injection" installation, but it may lead to adverse outcomes such as a business loss of the possible production. This can also result in an under-sizing of rooftop PV installations and sub-optimisation of the rooftops' potential to install solar PV.

- **Revise long-term loan regulations to allow for the payment of renewable energy installations from cost savings.** This would improve loan conditions and access to finance, making project ownership more affordable.
- **Improve credit risk regulations to boost self-owned installations and on-site PPAs.** Project-financing banks typically require an investment rating from electricity consumers. While few large companies benefit from investments rating, many SMEs do not. SMEs are therefore more likely to be excluded from owning a renewable energy installation or from signing a PPA.

Example

Securing credit risk is essential to the success of owning a project or for the success of a PPA. To overcome this challenge, the Norwegian export insurance company offers a credit insurance support as an additional option to traditional insurance markets. The credit insurance from the Norwegian Export Credit Guarantee Agency led to a boom in corporate PPAs in Scandinavia, mainly for large volumes. For on-site generation, a simpler system would need to be developed.

- **Make accessible support schemes to systems that are owned or operated by a third party.** For example, in the form of tax deductions for medium-size on-site installations between 100 KW and 1 MW when electricity is consumed on-site, even when the installation is owned by a third party under a leasing or rental contract.
- **Create a level-playing field for storage.** Member States should adequately implement the provisions of the Clean Energy Package on storage and prosumers, and transpose such provisions into national legislation. The provisions in the Clean Energy Package, specifically in the Market Design Regulation 2019/943 and Market Design Directive 2019/944, constitute a solid basis for the deployment of storage.

Example

These provisions would facilitate access to electricity markets and open new markets: wholesale markets for energy shifting, balancing markets, and existing and future markets for other non-frequency related ancillary services such as reactive power or congestion management.

Members States should remove barriers and distortions on storage – such as avoiding double taxation on battery storage, both at consumption and at generation, when providing flexibility services – so prosumers can more easily invest in storage technologies.

4. Policies should support all stakeholders in the energy market to achieve an efficient use of the infrastructure investments required

- **Extend collective self-consumption beyond single buildings or multiple-apartment blocks**. Provide flexibility in relation to delimiting the scope of jointly acting self-consumers beyond the sole borders of a building or multi-apartment block (so-called collective self-consumption). This would allow scaling up on-site generation beyond the C&I facilities, as seen in the examples of collective self-consumption. The perimeter of operations, as a determinant of the maximum self-consumption rate that can be achieved, is sometimes more important than getting a revenue from the sale of excess electricity.
- **Develop markets for storage.** Create appropriate market signals at Member State level for the wider adoption of storage, by allowing batteries to store electricity if the grid is too congested, thereby reducing grid congestion and contributing to reduce network costs and investments needs.

TABLE 5
EU Regulatory Framework fit for the future for commercial and industrial self-consumption

	Policy Recommendation	Explanation	Policy Framework
1	Enhance framework for C&I on-site renewable energy self-consumption enabling businesses to play their full part in the energy transition	Do not apply disproportionate administrative procedures for C&I self-consumers Define appropriate measures to facilitate the development of C&I self-consumption installations, commonly medium-sized Provide stable and predictable support to innovative business models for C&I self-consumption Remove barriers inhibiting GO assignment from behind-the-meter projects to building owners or operators	RED II – Article 21
2	Provide better safeguards for corporate buyers and sellers to support enabling frameworks for corporate renewable energy PPAs in the NECPs	Despite the good provisions in Article 15.8 of the RED II to remove barriers to corporate PPAs, the Commission could aim to share best practices from Members States which have undertaken concrete measures to promote corporate renewable PPAs as part of their national policies	RED II – Article 15.8

	Policy Recommendation	Explanation	Policy Framework
3	Accelerate and simplify permitting procedures for the deployment of on-site renewable energy and storage installations and their connection to the electricity grid, while maintaining environmental standards	Simpler administrative procedures to obtain construction and grid connection permits would shorten the processing period, resulting in lower all-in costs for energy developers and customers	RED II – Article 16, Market Design Directive – Article 15
4	Define fair consumer metering costs	Businesses should not bear unreasonable costs for metering or billing services from DSOs and TSOs	Market Design Directive – Article 18,19, 21, Chapter IV & V
5	Remove barriers and distortions on storage, including barriers on stacking of services	As storage can both absorb and release energy, storage should not be taxed twice at consumption and at generation Renewable energy and storage should have access to all markets, especially those for flexibility and ancillary services, with products that value fast and accurate services The provision of several services simultaneously, e.g. self-consumption and ancillary services, are beneficial to the system and should be allowed	Market Design Directive – Article 15
6	Define simple and fair remuneration frameworks for excess electricity injected into the grid for C&I prosumers	C&I prosumers should have access to a fair remuneration for the excess electricity fed into the grid, at least reflecting the market value of that electricity, and thus trigger investments C&I consumers owning renewable energy and storage should have non-discriminatory access to all electricity markets, including through aggregation, and especially those for flexibility and ancillary services, with products that value fast and accurate services	RED II – Article 21, Market Design Directive – Article 17

This legislative framework would enable businesses to play a more important role in meeting EU and national renewable energy targets and trigger a large-scale transformation of our cities and built environment. The Renovation Wave Strategy proposed by the European Commission in October is a unique opportunity to promote on-site renewable energy for C&I facilities and maximise the positive impacts that green and energy efficient buildings can have on health and quality of life, economic recovery, and the creation of green jobs. In this context, by June 2021 the European Commission will revise the Energy Efficiency and Renewable Energy Directives (REDII) in the context of the Fit for 55 Package. The revision of the RED II by June 2021 will consider **strengthening the existing renewable heating and cooling target** in accordance with the proposed higher climate target ambition for 2030 and introducing a requirement to use **minimum levels of renewables in buildings**. This will be complemented by a range of further initiatives including proposals to revise the Energy Performance of Buildings Directive by the end of 2021.

Measures to further boost the adoption of on-site renewable electricity generation

After the removal of the barriers to unlock the potential for C&I self-consumption, to further support this market segment, Member States and municipalities can adopt proactive measures to boost on-site renewable electricity generation and storage.

In particular, Member States and municipalities can adopt solar mandates to make solar PV installations mandatory on buildings, under certain circumstances. The mandate may comprise, among others, retrofitting old roofs or mandating the installation of solar PV in future constructions. Measures can also involve storage, thereby contributing to grid integration and reducing the mandated size of the installation.

Policymakers at EU, national, and local level can learn from the following experiences.

State level

Austria pledged to fit 1 million roofs with solar by 2030 as part of its plan to achieve climate neutrality by 2040, and in line with achieving its objective of sourcing all its electricity supply from renewable sources by 2030.

The decision made by the Austrian government is in line with SolarPower Europe's Solar4Buildings campaign, calling for PV panels to be installed on all new and renovated residential, commercial, and industrial buildings.

International example: **California** introduced a solar mandate at the beginning of 2020, requiring single-family and multiple-family dwellings up to three stories tall to add enough PV to, on average, meet the home's estimated annual electricity needs. The policy offers the possibility to trade-in obligatory "PV credits" through "storage credits". The residential solar mandate is expected to add more than 1 GW of PV over the next five years.

California solar mandate by the numbers

- Additional upfront cost to new single-family homes: $8,400
- Cost equivalent in mortgage payments: $40 per month
- Electricity bill savings: $80 per month
- Net savings: $40 per month, $500 per year

Local level

In Germany, the city of **Tübingen** introduced a solar mandate in 2018, requiring solar installations on all new houses and commercial buildings, with municipalled leasing options for those unable to self-finance the systems. The mechanism allows the city to purchase sites for new buildings and insert the new policy to develop the solar infrastructure before selling these sites to private buyers or building companies.

Utrecht, the Netherlands, wants to introduce an obligation for every roof to be greened or to have solar panels installed on all buildings in the city district. The municipality would administer a grant scheme to cover 50% of the costs for homeowners who want to green their roofs, up to a maximum of €20,000 per application. The "no roofs unused" policy is part of a plan to reinvigorate biodiversity in the city.

International example: in **New York City** two new laws provide a major boost to the city's sustainable roof policies. The laws require solar panels or green roofs on all new construction and buildings undertaking major roof renovations. A "sustainable roofing zone" is a new term in the Building Code for an area of roof with solar panels or green roofing — or a combination of the two. For new construction and major roof renovations, building owners must install a "sustainable roofing zone" on 100% of the available roof area. There are exceptions based on the competing priorities for roof space, including fire code setbacks, mechanical equipment, and recreational spaces.

Highlights of the laws in NY that aim to spur solar and green roofs

- The laws cover all building types and sizes
- Applies to all new construction, plus major roof renovations on existing buildings
- Requires a "sustainable roofing zone" on all available roof area, which means either solar PV systems, a green roof, or both
- Includes a five-year grace period for some affordable housing and distressed buildings
- Strengthens NYC's cool roofs requirements

These measures are ambitious and present challenges, and they require solid and extended renewable energy legislation that provides the funding required, enough available rooftop space, as well as the support of building owners. These measures, together with removing the barriers described in this report, are important for the C&I sector to significantly contribute to achieve Europe's 2030 renewable targets, will be an important component of Europe's Renovation Wave Initiative, and help meet Europe's bold commitment to reach climate neutrality by 2050 – the heart of the European Green Deal.

Make it happen: a simple 4-step approach for businesses to on-site renewable electricity generation and storage

Installing renewable electricity on-site does not have to be a complex process, on the contrary, on-site solar today is highly standardised. By following a structured approach and understanding of key building blocks, on-site installations should be "as easy as pushing a button".

1. Define renewable energy ambition
2. Identify key stakeholders and explore model options
3. Ensure scalability and continuous improvements
4. Select model and partner

So, you have decided to move forward with an on-site strategy, now what?

Once you have defined your renewable energy ambition, formulated your "value statement", and decided to install a solar PV or a wind installation or storage on your site(s), you need to understand and evaluate the key building blocks across the lifecycle of the assets to determine which approach and model suits you.

As moving toward an on-site installation involves getting the buy-in of a wide range of internal stakeholders, it is imperative to identify and involve the key stakeholders early in the process. An on-site renewable energy project will typically involve your colleagues from: Procurement, Sustainability, Finance, Legal, and Facility management. Make sure to have a plan for what unique information they need.

A successful strategy will align renewable energy ambitions to overall company objectives, obtain buy-in from the stakeholders, and select the right model and approach. Make sure to analyse and consider multiple dimensions with identified stakeholders of on-site renewable electricity generation and storage and the possible implications in terms of resources, skills required, costs, and potential risks over the entire lifecycle of the assets.

IKEA, Adelaide
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Dimensions to consider across the lifecycle of the asset

The following are the 9 dimensions a corporate should consider and discuss with stakeholders before moving towards an on-site installation.

<table>
<tr><th colspan="2">Dimension</th><th>Ownership</th><th>PPA/Lease</th></tr>
<tr><td>1</td><td>Project governance / management
Project management and coordination of the electricity and storage installation from start to end</td><td colspan="2" rowspan="2">• Establish project governance and involve key stakeholders early in the process
• Develop business case (LCOE) that covers the full lifecycle of the asset
• Decide on business model and adjust scope, team, and time plan accordingly</td></tr>
<tr><td>2</td><td>Business case
Development of business case, LCOE (Levelised Cost of the Electricity)</td></tr>
<tr><td>3</td><td>Financing
Definition of financing mechanisms and capital requirements</td><td>CAPEX required</td><td>No upfront costs</td></tr>
<tr><td>4</td><td>System design
Evaluation of sites and optimal system configuration based on cost and performance, including detailed electrical and mechanical drawings</td><td rowspan="2">• Procure services, separately or bundled
• Align with legal and compliance as well as insurance per jurisdiction
• Ensure to establish KPIs to incentivise electricity output
• System maintenance costs can either be built into the installation cost or paid for as a subscription service over the lifetime of the project</td><td rowspan="2">• Focus on the value and outcome that you, as the buyer, are looking for: e.g. price per MWh, completion date, production profile, performance guarantees, etc.
• Do not look under the hood of the “PPA”, for example, EPC cost, panel technology or system design
• Move risk to the electricity supplier, focus on savings</td></tr>
<tr><td>5</td><td>Engineering, procurement & construction, and hardware equipment
Detailed design, procurement, installation and commissioning of components</td></tr>
</table>

Dimension		Ownership	PPA/Lease
6	**Insurance and legal compliance** Ensure sufficient insurance of the energy installation in relation to the property where it is installed. Ensure legal compliance	• Procure services, separately or bundled • Align with legal and compliance as well as insurance per jurisdiction • Ensure to establish KPIs to incentivise electricity output • System maintenance costs can either be built into the installation cost or paid for as a subscription service over the lifetime of the project	• Operation and maintenance are included at no additional cost to the buyer
7	**Operations, monitoring and maintenance** IT solutions, processes and resources for operations monitoring and triggering of maintenance of the energy installations as well as monitoring of the power output and performance		
8	**Continuous improvements, new technology and value streams** As technology evolves and costs of new technology (e.g. storage) decrease while, at the same time, new value streams (e.g. grid ancillary services) become available in more markets, it will be relevant to continuously upgrade the energy system to further improve the business case and increase the sustainability value	• Ensure capabilities that are up to date with new technology to incorporate into the energy asset	• Select a partner that will incorporate innovations and improvements and how / if that will impact the PPA price
9	**Dismantling and recycling** Be sure to include potential cost of dismantling and correct recycling	• Include cost for this in the business case	• Typically cost included in PPA at the end of term

Select a model and a partner

Now that you are clear on your renewable energy ambition, alignment with the corporate objectives, and understanding of the key dimensions to consider across the lifecycle of the assets, it is time to select the right business model and partner(s) for your company.

Regardless of your preferred model, think big from the start – on-site installations are easier than you think

Final thoughts

This report covers the challenges and barriers associated with unlocking the potential of on-site renewable electricity generation and storage. It also explains multiple near-term actions that could be taken to overcome the challenges and barriers. The report has been designed to be a living document to be updated with more relevant information over time. We hope to cover more business models and best practices emerging from countries working to meet their own climate and energy objectives on time as well as contributing to Europe reaching climate neutrality by 2050. If you have any comments or questions, or if you would like to contribute to this document, you can contact us at info@resource-platform.eu.