PV AND BATTERY SOLUTION BOOKLET

EU Smart Cities Information System

SCIS Smart Cities Information System | April 2019 | version 2.0

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WHAT IS THE SMART CITIES INFORMATION SYSTEM?

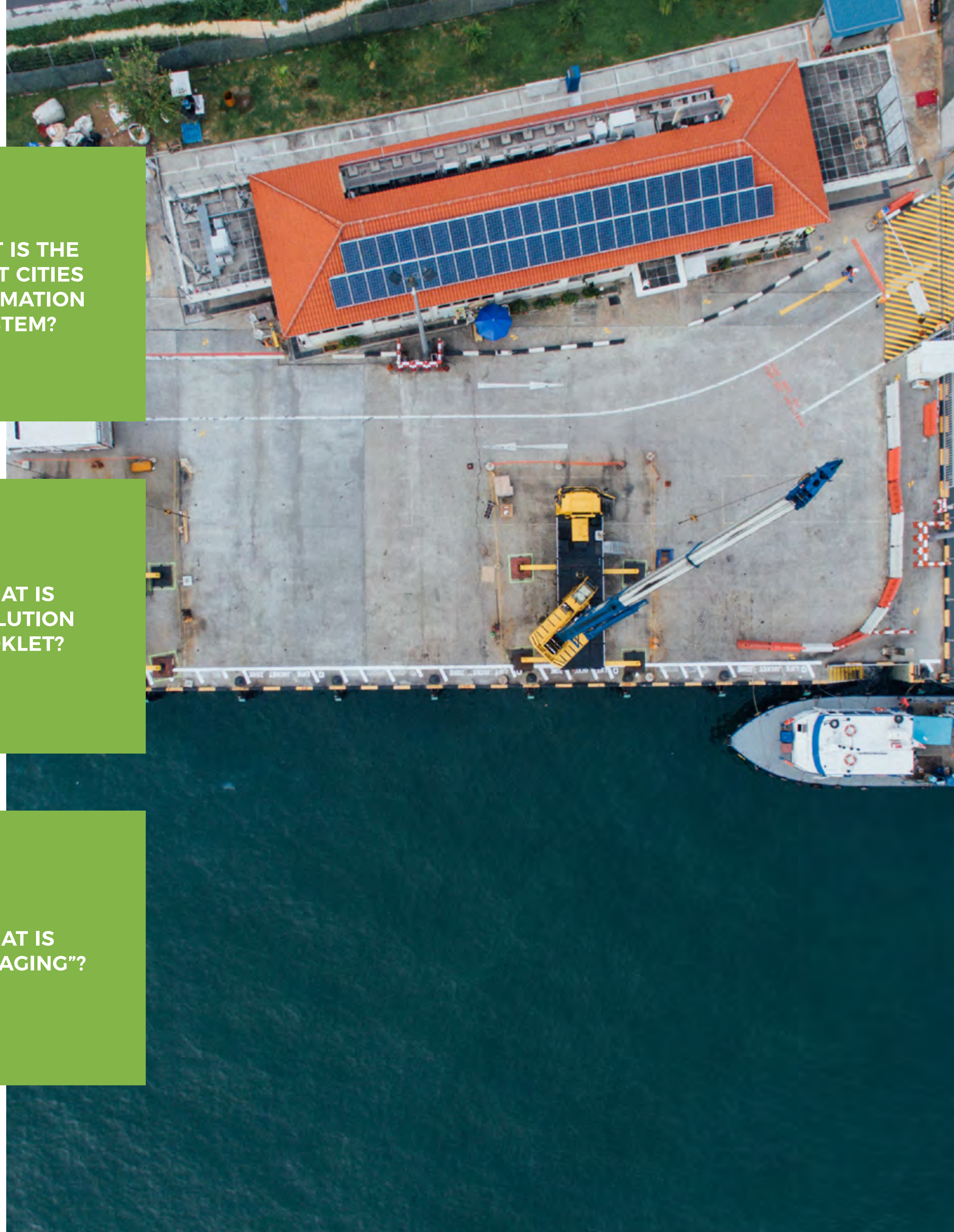
The Smart Cities Information System (SCIS) brings together project developers, cities, institutions, industry and experts from across Europe to exchange data, experience, know-how and to collaborate on the creation of smart cities and an energy-efficient urban environment.

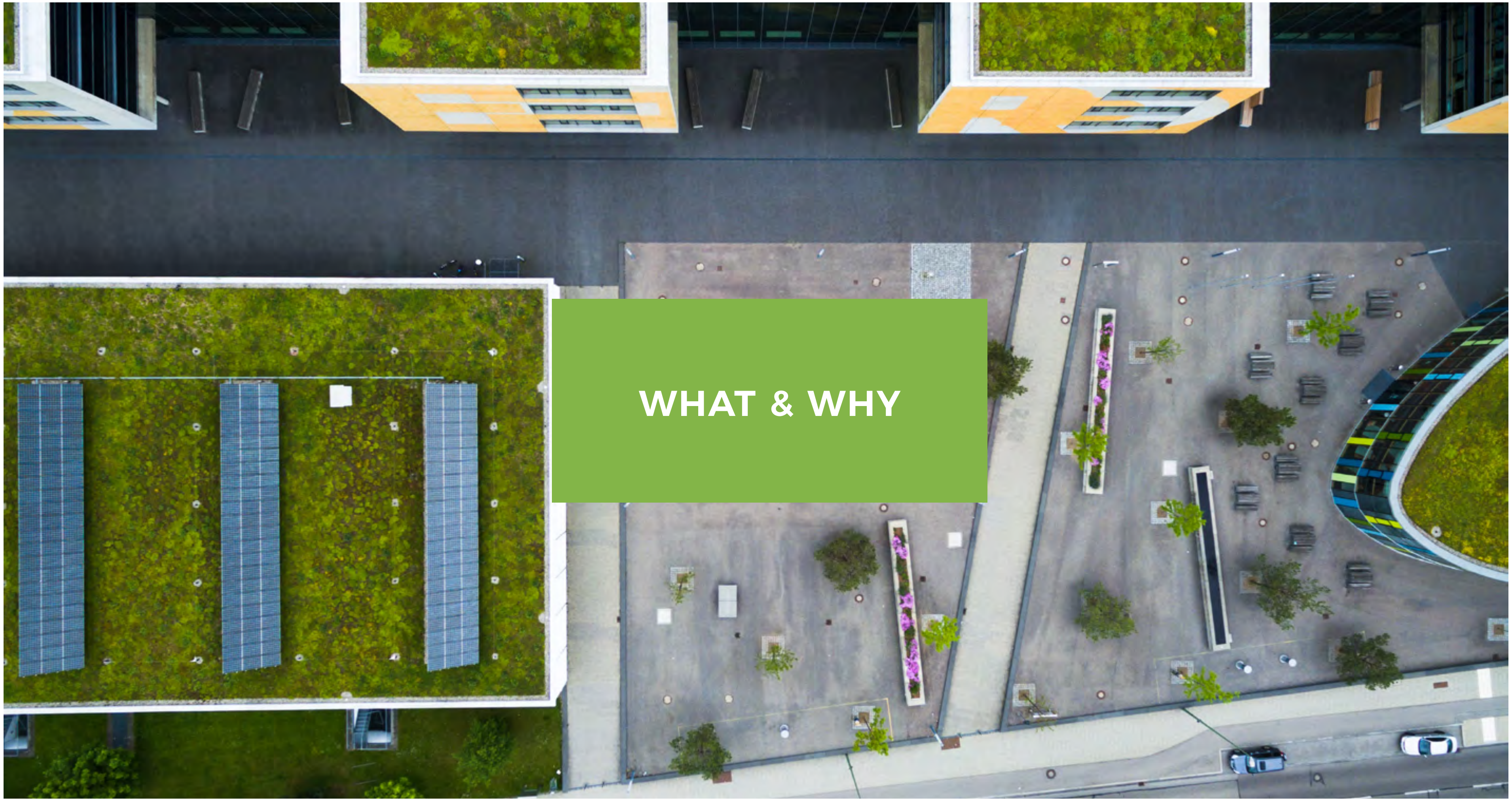
WHAT IS A SOLUTION BOOKLET?

A summary of the management framework, primarily written for cities. It seeks to reduce the effort, speed up the process, strengthen quality and confidence in outputs, align across disciplines, and generally prepare a city to engage the market to acquire a solution.

WHAT IS “PACKAGING”?

‘Packaging’ addresses the societal needs, technical solutions, business models and financing for a measure – and offers ways to put these in the particular context of the city/ cities in question. It is supported by a growing number of templates to speed up and make consistent the resulting output.





WHAT & WHY

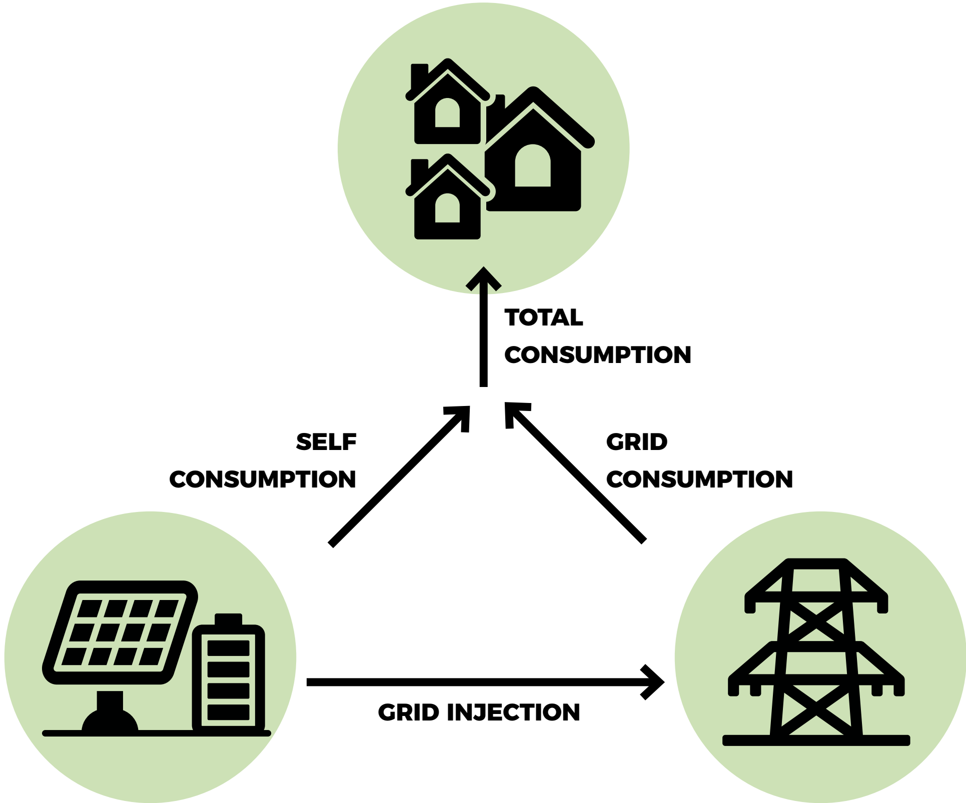
WHAT & WHY

The overall goal of the transition in the electricity system is to increase the share of renewable energy sources in buildings and neighborhoods. The large-scale roll-out of photovoltaic (PV) panels and battery energy storage systems (BESS) play an important role in this perspective.

PV panels produce renewable electricity and batteries could store it for times when electricity is needed but not available from renewable production. The combination significantly increases the **share of renewable energy** in electricity consumption and therefore, contributes to the reduction of greenhouse gas emissions.

PV & batteries not only allow to decrease energy consumption from the grid, they also make it possible to control the peak power demand and the timing of grid consumption and injection. This way they play an important role in **stabilizing the grid**, reducing losses and averting costs to increase grid capacity for increasing electricity demand and injection. They can help to reduce local black-outs and could guarantee the availability of electricity in case a black-out occurs nevertheless.

PV & batteries allow the end consumers to **reduce electricity costs** and significantly lower dependency on fluctuating electricity prices. Furthermore, they can improve power quality which prolongs the lifespan of electrical devices.



CITY CONTEXT

CITY CONTEXT

In general, it is expected that the electricity demand will increase. Not only are people using more and more electrical devices (smart phones, tablets, etc.) but an electrification of energy demand is expected as well in both space heating (with heat pumps) and mobility (electrical cars, e-buses, e-bikes, etc.).

Both the increase in electricity consumption and the **increase of decentralized power generation** challenges the grid which is often sized on less connections, smaller consumptions and a top down centralized electricity production.

The challenge rises as electricity is not necessarily produced at the same time it is consumed. Without any flanking measures, this could lead to **congestion problems** and a lower power quality, which can shorten the lifespan of electric devices and cause blackouts. It also limits the achievable share of renewable energy.

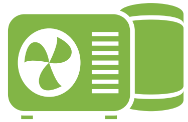
These problems are **local in nature** and can occur in any street or neighborhood in all cities and municipalities. Because of the local nature of this challenge, cities and municipalities that are better informed and pro-

mote the solutions in a targeted way, will be least confronted with the consequences of congestion problems.

One of the crucial measures to solve this challenge is to **shift certain electricity demands in time** to align them maximally with the renewable electricity production. Through demand side management, the consumption of some devices can be shifted in time without the end consumer having to change behavior, such as heat pumps for space heating or production of domestic hot water, air conditioning, swimming pool heating, electric vehicles etc. However, some appliances are not flexible in nature, such as electricity for cooking, ironing, hair drying etc.

Electricity demand will increase

DEVICES

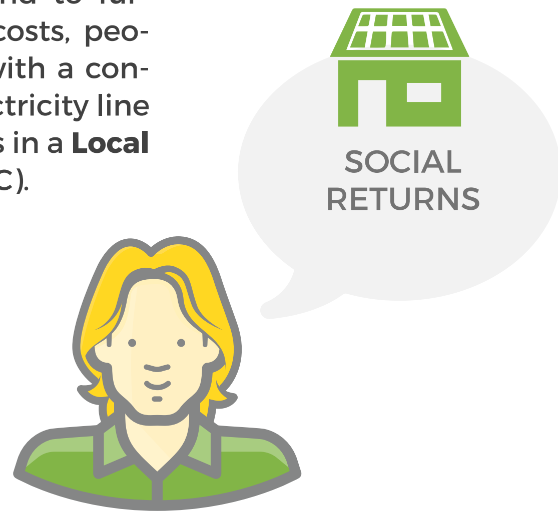


HEATING

VEHICLES

PV & batteries allow to use electricity produced from renewable sources for appliances that cannot easily be shifted in time. By storing the electricity from the solar panels in the battery when electricity demand is low, the grid isn't overloaded by injecting too much electricity when the sun is shining. Later in the evening, electricity from the battery can be used instead of electricity from the grid when everyone is using electricity at the same time, while no more renewable energy is available. This way the grid balance is guaranteed and the share of renewable energy sources in the electricity mix can be further increased.

To further increase power quality and renewable share and to further reduce electricity costs, people and organizations with a connection to the same electricity line can organize themselves in a **Local Energy Community** (LEC).



SOCIETAL & USER ASPECTS

SOCIETAL & USER ASPECTS

Stakeholder support & citizen engagement

PV panels are generally well accepted in society. The public understands that they are important to increase the share of renewable energy and decrease dependency on fossil fuels. PV panels are installed and maintained by local workforce and therefore, benefit local economy.

SOME EVOLUTIONS ARE EXPECTED TO FURTHER INCREASE STAKEHOLDER ENGAGEMENT

- The expected market increase of building integrated PV panels (BIPV) further contributes to social acceptance since they are less of a visual barrier.
- Sharing or renting (public) roof space facilitates to participate in PV projects. When applied in a local context, community spirit benefits from this since they are together in a project that benefits all participants.

The effective market uptake of small-scale building level and neighborhood **batteries** shows delays compared to projections. Besides pricing and potential return on investment, end-consumers and decision makers lack of information and understanding of the technology hold back implementation.

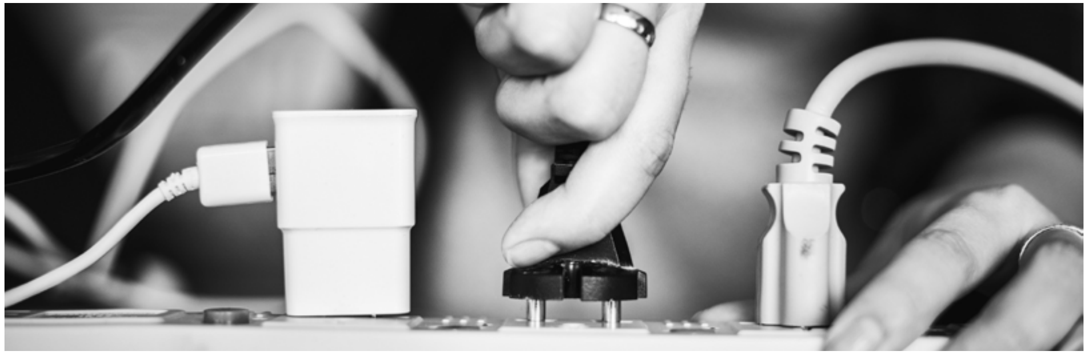
When dealing with battery energy storage systems, it is crucial to respect all **safety measures** required for the transport, installation and use of the selected battery type. Like with any other device, these safety measures are designed to protect the end consumer.

Improving power quality and limiting the number and the impact of black-outs can significantly improve comfort. This can result in increased social acceptance of battery systems in neighborhoods with limited grid capacity, increasing electricity consumption and PV panels.

Lessons learned

To realize the roll-out of PV & battery installations, social acceptance of the new solutions is very important, especially **in a residential area:**

- **Take actions on customer engagement.** Take time to explain the concept, what customers may expect and listen to their concerns are a part of this.
- **Take into account** that the comfort level of the households involved must be guaranteed at all times.
- **Maximize user-friendliness** of the PV & battery system.
- **Limit the need for house visits** by requiring technologies and management systems that are tested and robust.
- **Select partners with care.** For instance, the partner that has to go in the houses for customer service should be experienced in this to minimize the inconvenience for the end users. Demand a fast response time in case a problem occurs nevertheless.
- Keep in mind that end **consumers feel more comfortable when a well-known brand installs the battery**, rather than a small unknown player.



- When working with the local authorities, it may be useful to **involve a legal expert** for the communication. If the right connection is made with legislation, local authorities may feel more confident with approving the project.
- **The lead-time for battery energy storage systems can be long.** The order should be given well ahead in order to meet project milestones. Keep this in mind when planning the project.

LEGAL EXPERTS

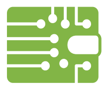
GOOD PLANING

CUSTOMER ENGAGEMENT

USER-FRIENDLY

BEST EXPERTS

NON-STOP COMFORT



BEST TECHNOLOGY

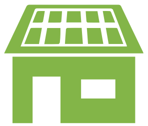
WELL-KNOWN BRANDS

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

Description – components of the system

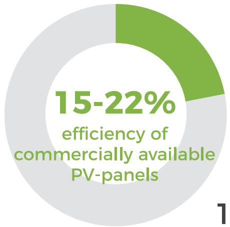
PV panels



In most cases the panels are installed **on rooftops**. In order to withstand wind forces, the panels should be well fixed or stabilized with the use of ballasts. Either way it should be made sure that the roof can manage the additional weight.

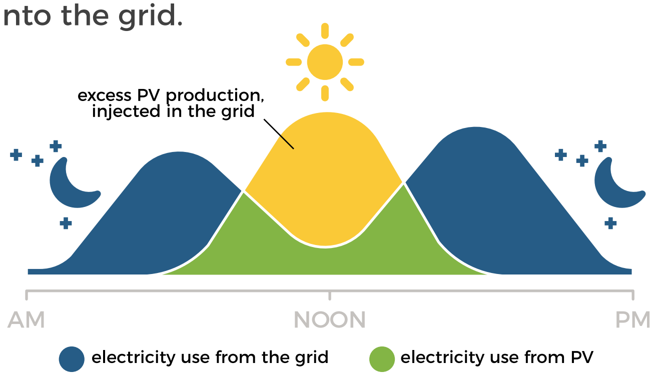
Since urban space is very valuable and since the visual appearance of standard rooftop PV panels can in some cases be undesirable, more and more types of **building integrated PV panels** (BIPV) are developed. Examples are roof tiles, flexible, foldable, translucent and/or colored panels. There are even integrated solar panels on the roofs of cars or designed as solar-trees.

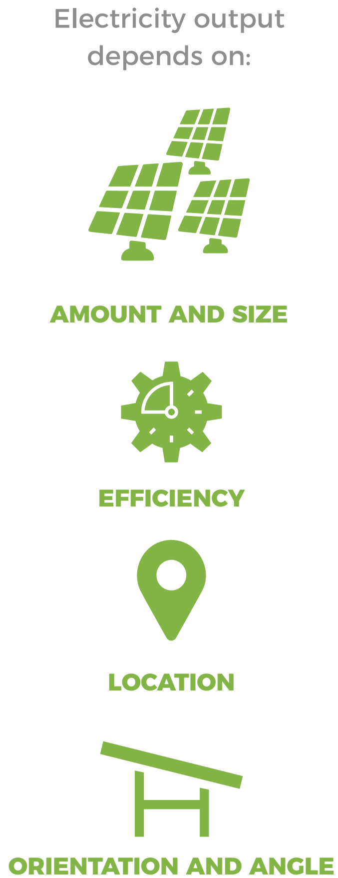
The **electricity output** depends on the amount, the size and the efficiency of the panels, but also on the location, orientation and angle. Since the panels produce electricity from solar radiation, electricity is only pro-



duced during daytime. In summer the production is significantly larger than in winter. Commercially available PV-panels have an efficiency of 15-22%. In most installations an inverter converts the variable direct current (DC) from the solar panel to alternating current (AC) before the electricity is used. In combination with batteries, the inverter can do a DC/DC conversion.

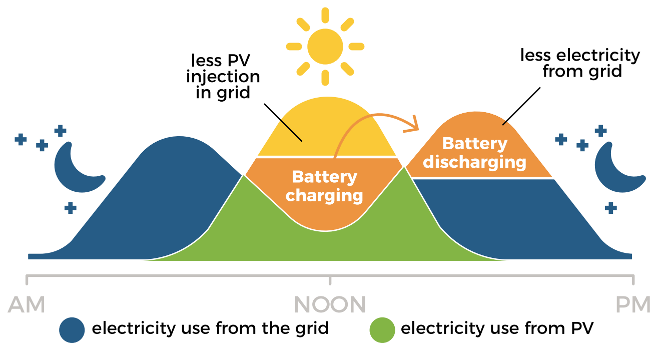
When the building's electricity demand exceeds the PV production, the surplus demand is delivered by the grid. When the PV production exceeds the electricity demand, the excess production can be injected into the grid.



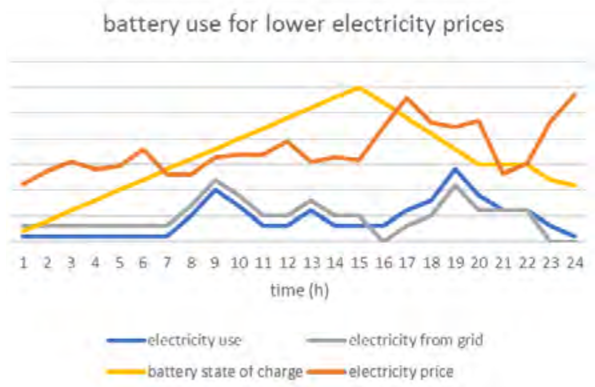


Use of battery energy storage system

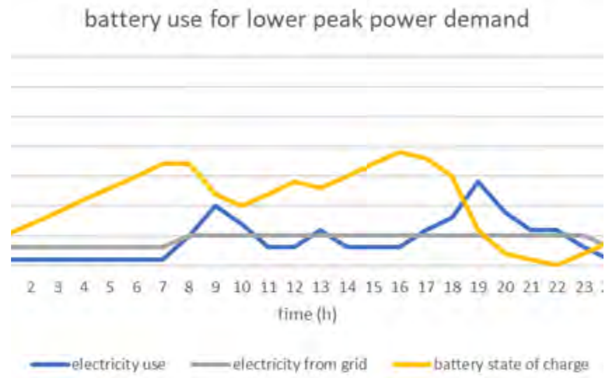
Batteries are used to store electricity on a daily basis in the ideal case. This makes them highly suitable to charge electricity when the production of renewable electricity is larger than the electricity demand and to discharge when more electricity is needed than can be produced from renewables. In combination with PV panels, the battery increases the degree of self-sufficiency and self-consumption.



At times when PV production is low, the batteries can also be charged with electricity from the grid when prices are low, thus an excess electricity (from most likely renewable sources) is available on the grid. This electricity can then be used when electricity prices are high. This can improve both the business case and the share of renewable energy in the region.



Another way to use the batteries is for reducing peak demand and therefore, using a smaller grid connection. To do so, the battery is charged during (excess) PV production and during moments of low electricity consumption. During high consumption the battery can be discharged.



When power quality on the grid is poor or even during blackouts, the battery can be used to guarantee power availability and power quality within the building (entirely or for vital functions only), improving comfort and prolonging the lifespan of indoor devices.

Applicability

PV & batteries have the highest added value in buildings or neighborhoods where a high level of electrical devices and/or a high number of PV causes congestion and voltage issues on the electricity line.

But also, in neighborhoods without grid capacity problems, PV & batteries can contribute in increasing the share of renewable energy and balancing the grid nation-wide.

The solution can be applied on a single building, a building block that holds multiple tenants, and even on the scale of an energy community (neighborhood battery system).

Because a rooftop PV system can make it more complex to insulate the roof afterwards, in most cases it is advised to insulate the roof before installing this solution. The same remark goes for other parts of the building when installing BIPV panels.

It's perfectly possible to add a battery system to an existing PV system to get to the same result.

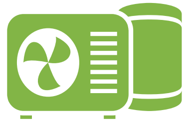
Other interesting ways to provide flexibility to the grid exist:

- heat pumps for space heating
- production of domestic hot water
- air conditioner
- swimming pool heat pumps
- electric vehicles (in a vehicle-to-grid appliance)

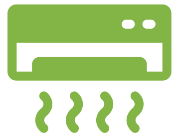
These flexible devices can contribute in a complementary manner and allow to select a smaller battery, which is beneficial for the project's feasibility.

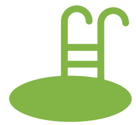
PV & batteries are very suitable for shifting loads on an hourly or even daily basis. It is however not suitable for:

- seasonal storage. Due to losses and the limited number of cycles a year, the PV production in summer cannot be stored until winter.
- fluctuations on a basis of seconds. Some devices (e.g. microwaves) have a very unstable electricity use profile which causes grid profile pollution. This phenomenon is not something that batteries can solve but should be solved by a better design of the devices.


HEAT PUMPS


HOT WATER


AIR CONDITIONER


SWIMMING POOL HEAT PUMPS

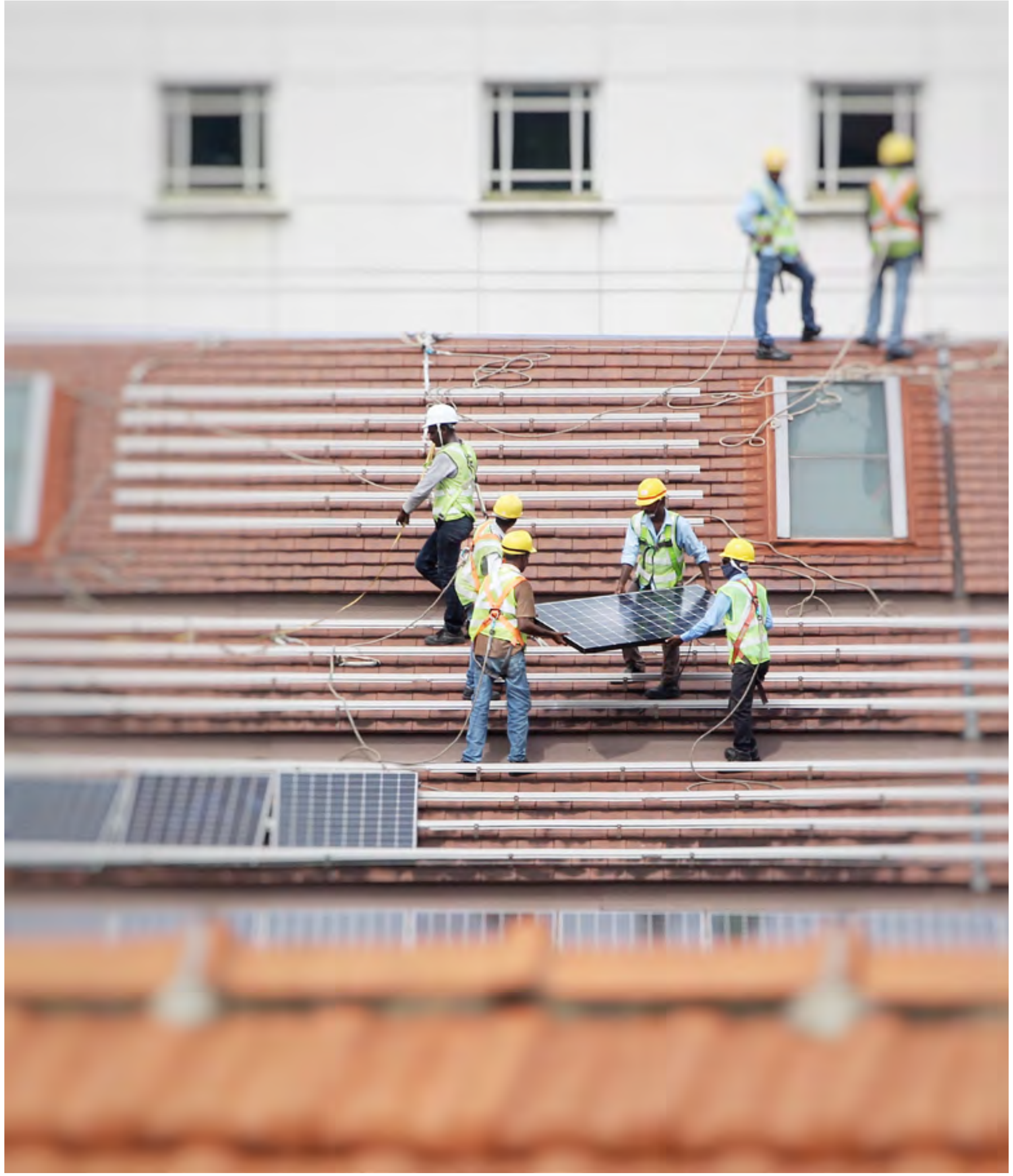

ELECTRIC VEHICLES

Selection, sizing and design of battery system

Many battery types exist. They differ in chemistry, size, capacity, energy density, efficiency, lifespan, environmental impact of production, rate of charging and discharging, etc. Because of these differences, each battery type has its own strengths and weaknesses and the choice of battery strongly depends on the application it is used for.

Depending on the electricity profile of the project, the right energy capacity of the battery (kWh) and power of the inverter (kW) is to be selected and the appropriate choice for a one-phase or a three-phase battery to be made. To do this, measurements are required that show the peak power demand, the electricity consumption profile, the electricity production profile and the loads that are already flexible and can be shifted in time without the use of a battery. Note that these measurements are not standardly available in residential buildings.

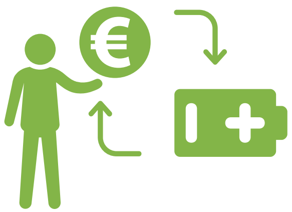
Since these choices can have a large impact on the performance of the system, the feasibility and safety of the installation, it is advised to contact an **experienced engineering company and installer.**



Lessons learned

The **market for battery systems** is not fully developed yet. This can lead to several issues:

- Some manufacturers of battery systems don't yet have a product that is meeting the expectations regarding functionality, quality and robustness.
- Some manufacturers don't yet have a distributer in all member states, which results in the batteries not being available everywhere.
- The customer service as provided by the manufacturers is currently very limited. This forms an issue regarding maintenance and repair.
- Some manufacturers even sell low quality batteries, while they claim it to be otherwise.



To deal with these issues, some measures can be taken:

- Be critical when buying a battery and don't just believe the advertising. Ask for references, go to sites, ask for a demo trial, ask them to be present at installation etc. Take into account that it may take several months before the product is delivered.
- Make contingency plans in the early project phase.
- Do a market survey of available technologies, components and alternative suppliers.
- Fix contracts with the battery manufacturer including penalties for delays and payment milestones.

Besides the battery itself, the **integration within new or existing infrastructure** is an important challenge as well:

- Tailor-made: since the grid characteristics are different in each context, systems have to be designed separately for each case.
- Interoperability: since a lot of devices come from different manufacturers, the communication between them is challenging.
- Limited plug-and-play solutions are available yet.

So, the success of both hardware and ICT integration strongly depends on:

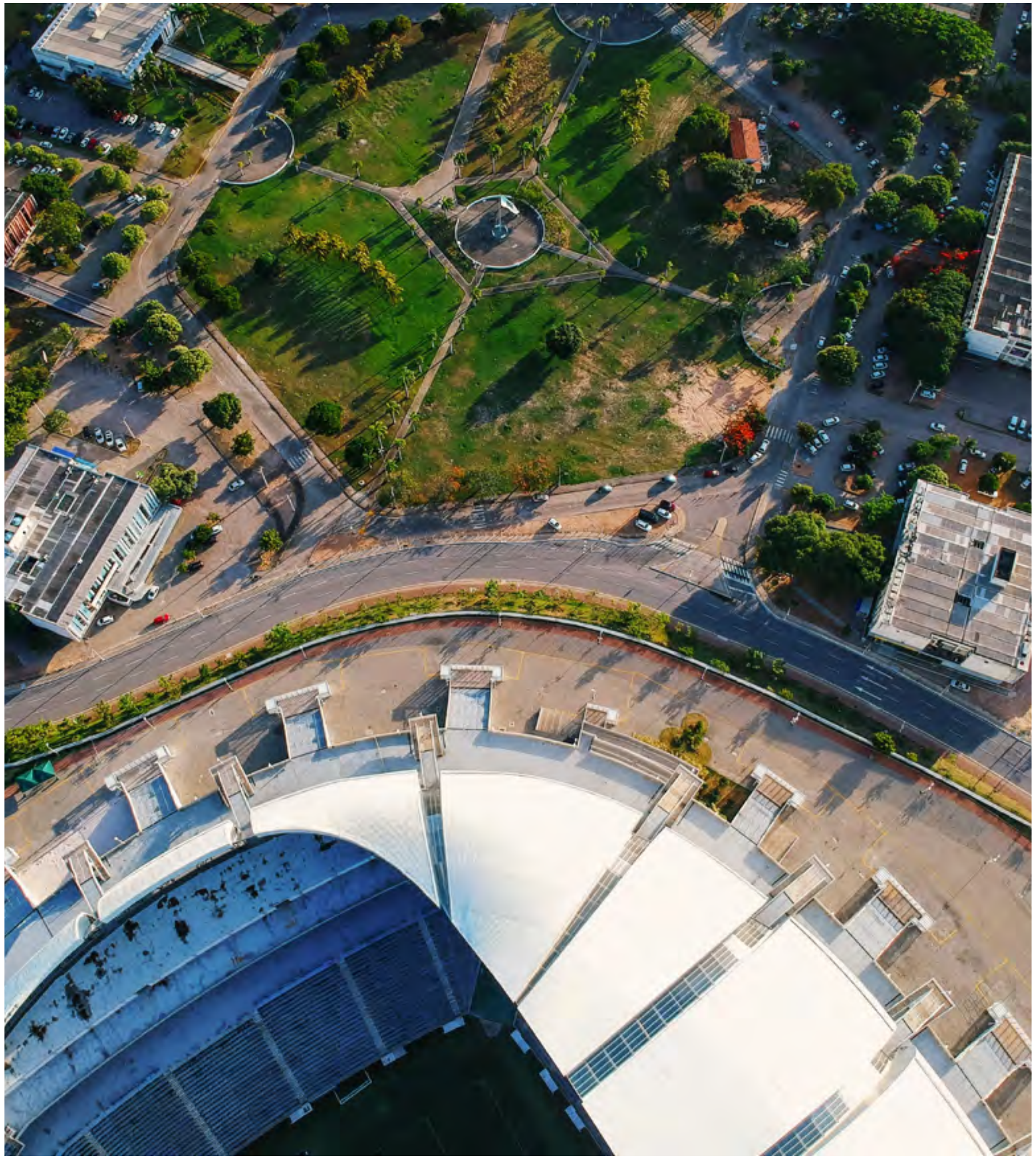
- The level of interoperability of the different devices and systems in a project.
- The knowledge and experience of the technology providers and designers of the overall system. So far, organizations with this type of expertise are very limited. Be critical and ask for references.
- Involve manufacturer of the batteries in the startup of the project and make the scope very clear in the contract.
- In a pioneer project, pre-test all components.

Practical example 1

With three-phase connections, it is important to select the right products and to connect them with the right phase. If not, the electricity from the PV panels may be fully injected into the grid on one phase, while the battery is charged fully with electricity from the grid on another phase, doubling the stress on the grid instead of lowering it. The same remark is valid when discharging the battery to use the electricity for electric devices in the building. So, when there is a three-phase connection, connecting PV & batteries to all three phases should be considered. If not, the impact and stress on each of the phases up until the feeder should be taken into account.

Practical example 2

Safety issues with regard to multiple phase buildings should be tackled. A single-phase battery bank coupled to one of the three phases of a building, allows the battery inverter to uncouple that one phase from the grid. When the battery runs empty, there is no more power on this phase. Devices with a three-phase connection are then connected to two phases with power and one phase without power. This is not a safe scenario and will cause damage. When a single three-phase battery bank is coupled to the three phases, this risk does not exist. With three single-phase battery banks it does.



BUSINESS MODELS & FINANCE

BUSINESS MODELS & FINANCE

Description – possible business models

Several ways can be used to generate revenue with the PV & battery system:

- Charge when renewable electricity production is high, discharge when it is low
- Minimize peak power demand to minimize the load on the grid
- Minimize consumption during peak demand on the grid

The way the PV & battery system is used strongly depends on the regulation and incentives that are in place, the local grid needs and may vary from one region to another.

The **economic feasibility of the PV & battery system** is defined by the costs and revenue coming from interaction with the grid. But also avoided costs for increasing grid capacity and increasing the lifespan of devices have an important impact. Pricing schedules and incentives can vary from one region to another and from one consumer to

another. Therefore, the economic feasibility of batteries should be determined for each project separately.

When the owner of the building, the PV & battery energy storage system and the users of the building are all the same, the **business model** is simple as both the costs and the benefits belong to the same person/family/business. However, when the owner structure is different, clear agreements should be made and officialized. When a certain scale is reached, an Energy Services Company (ESCo) can be considered to develop the system.

Economic performance indicators

Total cost of ownership (TCO) and return on investment (ROI)

The total cost of ownership gives an estimation of the direct and indirect costs and benefits over a certain period.

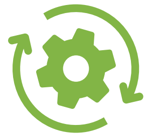
The return on investment shows how much gain or loss results from a certain investment, compared to this investment.

The costs that should be considered are:

1. INVESTMENT COST:
   a. materials and installation of PV panels, inverter and connection to the electric installation
   b. materials and installation of battery system and connection to the electric installation
2. MAINTENANCE COSTS:
   a. For PV panels this is generally very limited. Cleaning once every 2 to 5 years is sufficient, depending on the slope and the local environment.
   b. The battery system itself generally needs no specific maintenance.

INVESTMENT COST

MAINTENANCE COST



REPLACING THE INVERTER

3. REPLACING THE INVERTER EVERY 10 TO 12 YEARS
   a. Replacing the battery system after its life span (see below)
   b. An additional insurance fee (if relevant)
   c. Recycling contribution

The life span of PV panels is about 25 to 30 years although a gradual decrease in efficiency of about 0,3 to 1 % each year is expected.

The life span of batteries differs between each project since it strongly depends on:

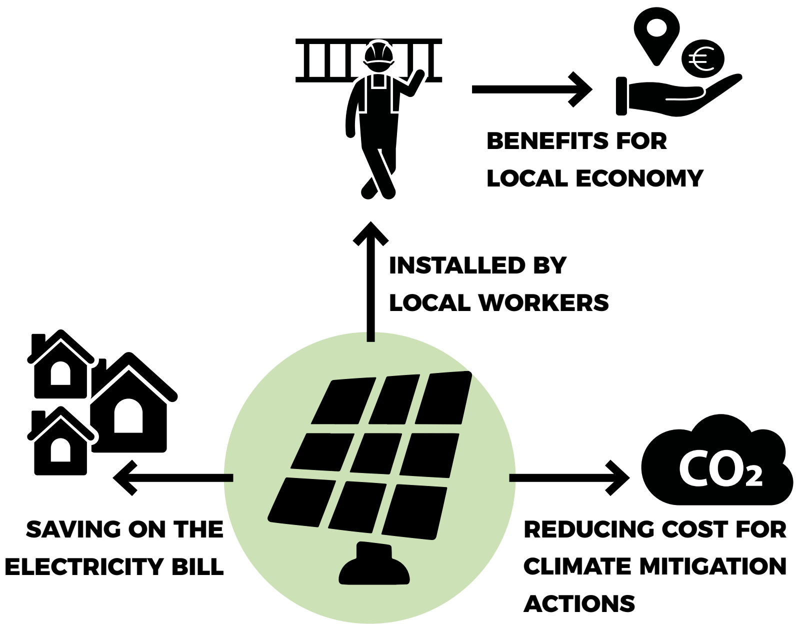
- type of battery
- the way the batteries are used (number of cycles, average depth of discharge, etc.)
- the conditions in which the batteries are kept (temperature, humidity, etc.)

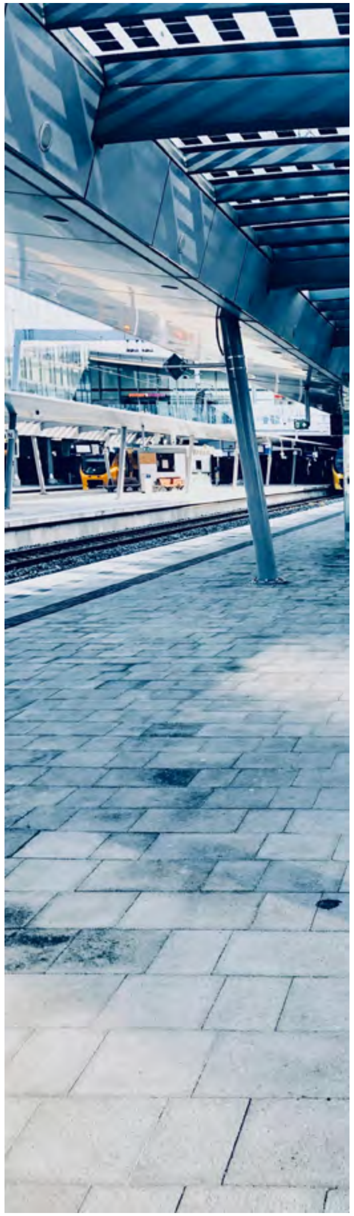
Revenue comes from:

- reduction of electricity (kWh) used from the grid
- reduction of peak power demand (kW) from the grid
- electricity injected in the grid
- providing flexibility to the grid by shifting electricity consumption and injection in time (this decreases the pressure on the grid which means costs for intensifying the grid are averted)
- less damage to indoor devices by improving power quality
- government support

Depending on the region, some subsidies and/or remuneration schemes are available. These can have a significant impact on the feasibility and the sizing of the installation. Some examples:

- netting: the electricity that is delivered to the grid can be extracted from the annual energy consumption on the bill. The amount of energy that can be extracted from the energy use, is limited to the amount of electricity taken from the grid.
- feed-in-fee
- subsidies
- - ...





Primary & secondary benefits accounting

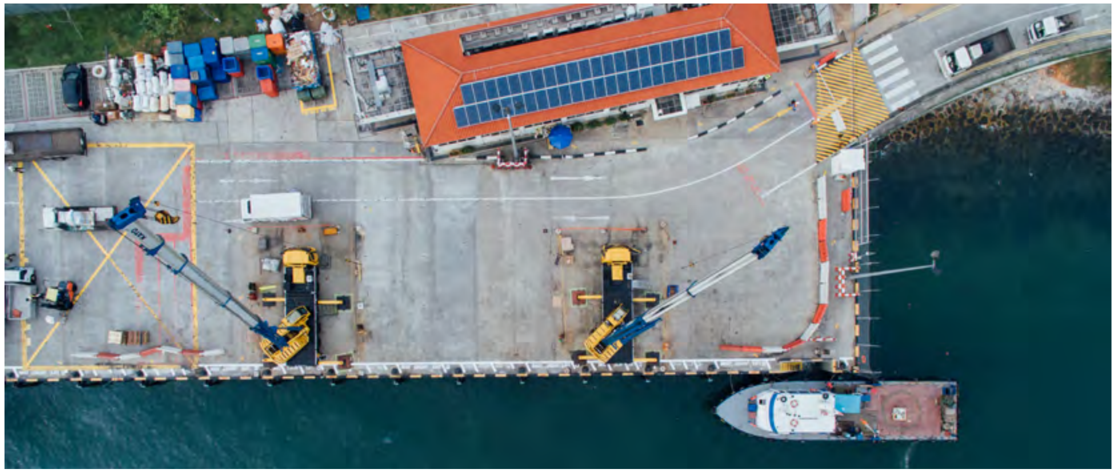
For government administrations it should be noted that PV panels are installed and maintained by local workers and therefore, benefit the local economy. On top of this, they help in reducing costs for climate mitigation actions. So, the savings are far greater than just the savings on the electricity bill.

Replication opportunities & boundary conditions

The replication potential of this solution is maximal where simultaneity between production from PV-panels and electricity consumption is limited and end-consumer electricity price fluctuations are substantial. Some common cases:

- In a **residential building** where the children go to school and the parents go to work, the solar production will be larger than the electricity use during office hours. However, when combined with batteries, the electricity can be stored so it can be used for cooking, cleaning, washing, lighting and watching television in the evening.
- The profile of an **office building** shows more simultaneity with the profile of PV production. Most of the time the electricity produced by the PV panels can directly be used in the office building. Especially during winter but even during autumn and spring, there is little to no excess PV production. This makes it harder to find a feasible business case for battery systems in office buildings or business centers.
- Depending on the profile of electricity consumption and PV generation potential, levering from a single building to a group of buildings or neighborhood, can bring additional benefits (including power quality).

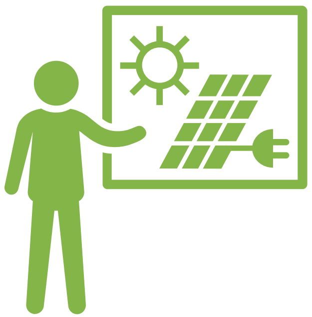
New market arrangements, service providers, contractual arrangements etc. all need development. Note that the regulatory barriers concerning support conditions and taxations have an important impact on the business case as well. At this moment **remuneration schemes for services provided by batteries are missing** in most member states. This is expected to evolve quickly over the coming years. Offering flexibility to the grid is after all a valuable service.



Lessons learned

A major issue for investors in this kind of project is the risk they are taking. Given the high investment cost, the losses and the unsure lifespan of a battery, it is very hard to find a good business case without a correct and clear incentive mechanism. In most member state this incentive mechanism is still missing, however it is crucial for attracting investors in this type of installations.

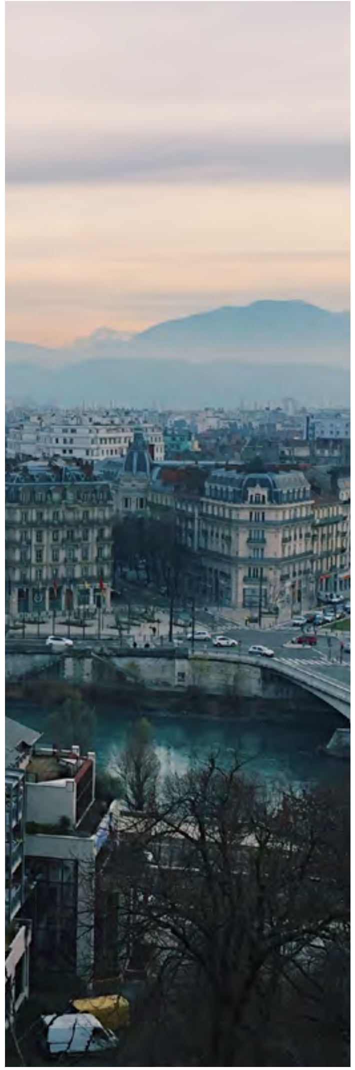
Another issue is that insurance companies do not seem to have any expertise on the impact of certain risk mitigation measures on the actual risk of installing PV & batteries. Fees are proposed depending on material and installation costs, with **no concrete assessment of risks mitigated** by technical choices for roof mechanical strength and waterproofness, battery technology and electric protections insuring safety.



In a demonstration project in France for the EU project City-Zen, a barrier concerning the insurance companies was encountered. It was not possible to find an insurance company that would insure the PV & battery system by itself. In order to avoid litigations between different insurance companies they all required the insurance for the PV & battery system to be included in the insurance for the entire building. The argument is that damage to the roof because of a PV system may cause leakage which can lead to significant damage to the entire building. However, for this particular project, the project coordinators were co-owner of the building and therefore, the insurance company could basically ask whatever they wanted with a yearly additional insurance fee of about 600 euro as a result. Since this is a third of the yearly revenue of this PV & battery system, this significantly increases the return on investment.

Example of an office building in Grenoble, France:

Total investment excl. funding	€52000
Energy cost savings in first year	€2100
Yearly insurance fee	€600



GOVERNANCE & REGULATION

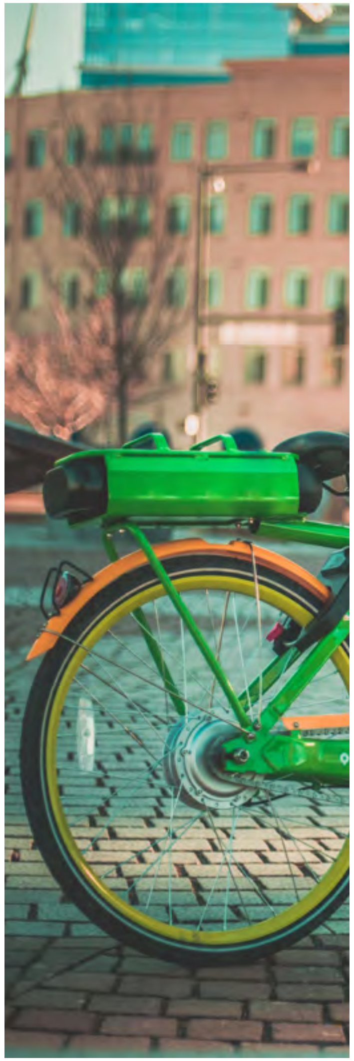
GOVERNANCE & REGULATION

Description – governance and regulatory barriers

In most member states a clear regulatory framework for both the installation and operation of battery systems is missing. Furthermore, there is a lack of legislation that drives the demand for flexibility services. These are major obstacles for the large-scale roll-out of PV & battery-systems.

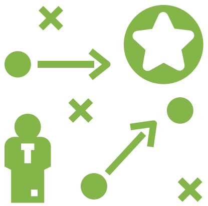
There are several **examples** from different member states where regulation forms a barrier for replication of PV & battery systems:

- batteries are considered as energy suppliers and are therefore restricted
- prosumers equipped with rooftop PV panels lose their PV-related support if they subsequently install batteries
- grid taxes on self-consumption are not proportional with regards to the size of the installation
- requirements for PV & battery support measures are linked to the grid connection, rather than the PV & battery installation itself
- storage systems are not yet defined in regulation. They are considered consumer when being charged and producer when being discharged. This way they pay taxes twice for electricity they do not consume, nor produce.
- battery owners are not allowed to buy (charging storage) and resell (discharging storage) electricity.
- PV owners pay an additional tax for the electricity they generate and use from their PV systems, even when it is not injected in the grid
- excess energy is not allowed to be injected in the grid
- subsidies for PV are stopped and taxes on PV panels that are increased
- storage used to offer flexibility to the TSO can not be used for other purposes
- aggregation of production or storage (for instance to participate in the wholesale market) isn't allowed



Measures to support replication

The administrative procedure to install a PV & battery system and to collect the benefits is complex. In some member states, these procedures can take up to 6 months or more before approval if they exist at all. There is a strong need for a clear regulatory framework throughout all layers of government. All stakeholders that are involved in the process of approval, should have clear guidelines on the requirements and how to check them.



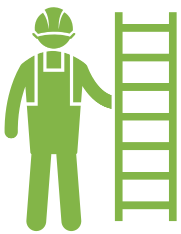
The criteria for approval should be clear, transparent and relevant. The time of approval should not be too long in order to make sure the **procedure** doesn't become a barrier by itself.

A clear **long-term vision and approach** towards a carbon-free energy system, based on renewables should allow for unambiguous policy and clear communication. Furthermore, the role of the DSO in facilitating this transition, hence enabling PV & battery integration, should not be underestimated.

Clear, unambiguous, easy-to-find information about the technology should be made available to all stakeholders. This means both the end consumers, investors, installers, etc. It should also be very low level, since most people don't have a technical background, especially regarding batteries. Informing the end consumer on what the system does and doesn't do also prevents them to contact the help desk for problems that have nothing to do with the battery system.

Lessons learned

Each country has its own safety regulation for transportation, fire regulation, recycling etc. Safety regulations should be standardized across all EU countries so that less administrative work is required and safety trainings can be more efficient and relevant. At this point, member states all have their own legislation on safety in battery transportation. This means that a company that transports batteries from one member state to another, should meet the requirements of all member states that it crosses, which increases administration and the costs of the batteries for the end client.



For both transport, installation and use, **safety regulations should be developed separately for each specific type of battery chemistry**, application and location. In most Member States, safety regulations are not adequate yet. Often experience from one type of batteries has led to safety regulations that are used for all types of batteries. However different types of batteries have different safety issues. This means that for some types of batteries some requirements may be too strict. But it also means that for certain types of batteries, the safety requirements are not rigorus enough. Research is required so that adequate safety requirements are set up for each individual type of battery (including second life batteries).

Local authorities and fire brigades have very little experience with storage systems at district or residential level. As a result, it takes a lot of time to convince authorities about the safety of a battery system. Information about the presence, exact location and type of battery in buildings should be available to fire brigades so they know what to do in case of a fire, even if the fire is caused by something else.

Under current market regulation, a good relationship with the **DSO** is important to get approval for system of choice.

GENERAL LESSONS LEARNED

GENERAL LESSONS LEARNED

PV & batteries installations can significantly contribute to increasing the share of renewable energy and improving power quality. To use its full potential and to maximize benefits, several factors must be considered.

Since the market isn't fully developed yet and a clear regulatory framework and legislation that drives the demand for flexibility are still missing, some pioneer work is required. To successfully implement a PV & battery system, a tailor-made system is needed. A complementary team should look for the most suitable business case based on market design and available incentives, design the system according to the local needs and install and operate it accordingly. Keep in mind that customer experience is of great importance throughout the entire process.

This solution booklet describes and gives lessons learned, based on the experience from several PV & battery projects funded by the EU. Both the user, technology, financial and regulatory aspects are considered, since they all contribute to the final success of a project.

Photo: Th!nk E

USEFUL DOCUMENTS

USEFUL DOCUMENTS

City-zen

DREEAM

Elsa

GrowSmarter

REMOurban

Story

IFC Solar report

CONTRIBUTIONS:

SCIS

The Smart Cities Information System (SCIS) is a knowledge platform to exchange data, experience and know-how and to collaborate on the creation of smart cities, providing a high quality of life for its citizens in a clean, energy efficient and climate friendly urban environment. SCIS brings together project developers, cities, research institutions, industry, experts and citizens from across Europe.

SCIS focuses on people and their stories – bringing to life best practices and lessons learned from smart projects. Through storytelling, SCIS portrays the "human element" of changing cities. It restores qualitative depth to inspire replication and, of course, to spread the knowledge of smart ideas and technologies - not only to a scientific community, but also to the broad public!

smartcities-infosystem.eu

Sharing Cities

The Sharing Cities 'lighthouse' programme is proving ground for a better, common approach to making smart cities a reality. By fostering international collaboration between industry and cities, the project seeks to develop affordable, integrated, commercial-scale smart city solutions with a high market potential. The project partners work in close cooperation with the European Innovation Partnership on Smart Cities and Communities and with other `lighthouse` consortia. Sharing Cities offers a framework for citizen engagement and collaboration at local level, thereby strengthening trust between cities and citizens. The project draws on €24 million in EU funding. It aims to trigger €500 million in investment and to engage over 100 municipalities across Europe.

sharingcities.eu

SCIS is funded by the European Union