

Community Solar

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Webinar Presenter

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Hugo Lucas Porta Hello, ladies and gentlemen. I'm very happy to welcome you to today's lecture on Community Solar, _____ by citizens. I would like to thank the International Solar Alliance and the Clean Energy Solutions Center, who facilitate this webinar series.

A few words about me. Before I joined Factor in 2010 I have been Director for Knowledge, Policies, and Finance at International Renewable Energy Agency, IRENA. At IRENA I was responsible for the initiative aiming in support in community power and initiative for multistate holders, called the Coalition for Action.

This lecture of today is part of the module 6 of the full training. The module 6, as you know, is on socioeconomic aspects of solar energy. In this lecture we will start with a brief definition of community power and afterwards we will jump into the main body of the presentation. Don't forget, at the end of the presentation you will be given the chance to test your knowledge with a little quiz.

The learning objective which the module aims to provide can be divided into three parts. First off we will see a brief overview of community power. This is followed by a detailed description of the characteristics, the status, and trends of community solar projects. Finally we will talk about opportunities for policymakers to maximize the role of citizens in the solar revolution.

But first of all I would like to discuss on the role of citizens. And you have a quick overview of how the role of citizens has evolved in the _____ deployment of the UN energies. And in particular with solar technologies for forward generation, for the _____ solar power, but mainly solar for the _____ because they are more attached to the cities. As usual, when

trying to introduce new technologies field reaction for citizen, it is not in my background. With that increasing exposure to projects and higher degrees of awareness people will start to be less negative and to engage in consultations for projects. We assume that projects will not affect their quality of life.

One of the main drivers for _____ deployment of renewable energy is the core benefits. The wealth creation. With an increased number of sites being developed for photovoltaic projects, local citizens surrounding the projects start to increase their demand for benefiting of the projects. Wealth is then shared with the communities through taxes to the solar projects, benefit sharing plans of project development, dedicated funds, or opening the equity of the project to local actors.

Participating countries will _____ deployment of solar, 50 per cent, half realize that photovoltaic technologies cause democratized energy, allowing citizens and communities to play new roles, previously played exclusively by big corporations, such as announcing the projects with their own savings or producing commercial energy at a larger scale, being part of a cooperative, for instance.

Finally, there will always be people opposed to projects. Academic literature refers to this attitude as BANANA, Build Absolutely Nothing Anywhere Near Anything. This lecture is mainly, but not exclusively focused in communities building solar projects where citizens are at the same time financing, developing, and operating new solar projects.

The main body of the presentation is divided into three parts. First of all we will learn about the concept of community solar power, followed by some insights on the status and trends of community solar projects, taking into consideration this is a quite new trend, quite new possibility, so there is not much research and there is not much monitoring and reporting of activities of a community power. There is not even an agreed global definition for these projects.

We will finalize with our discussion on policy recommendations to expand the role of citizens in the _____, and most especially in the solar revolution.

Community energy is a term used to describe the wide range of ways that communities can develop, deliver, and benefit from sustainable energy. It can involve supply-side projects such as renewable energy installation and storage and demand-side projects such as community integration, energy efficiency, and the _____ management. Community energy can even include community-based approaches to selling all this routine energy.

As per Coalition for Action of International Renewable Energy Agency, IRENA, community energies have project from filling any combination of at least two of the following elements: local stakeholders own the majority of the renewable energy projects. Voting control rests with a community-based organization. The majority of social and economic benefits are distributed locally. However, by use, definition of community energy are found

worldwide, depending on a government's intent to stealing investment and _____ safe in renewable energy generation in this direction. Requirements for communities to qualify as a community project may be more or less stringent, depending on the respective policy actual intent to democratize the energy access and to create a distributed energy system. This makes global study taking of community energy projects very difficult, as mentioned before.

How the community solar power project works. The sunlight hits the solar panel in the community solar field, generating electricity. The electricity generated flows through and is also metered to the electrical utility grid. The utility company measures the electricity generated, calculates a dollar value for the power, and distributes this dollar value proportionally to the members of the community's solar program. It can be residents, it can be businesses, municipalities, or other institutions.

The value of this solar electricity produced for their right is applied as a monetary credit to each member's electricity bill. In some countries there is an alternative to the net billing, the net metering, the electricity fit into the gate where the community is already discounted from the consumption.

Community solar projects have proven to provide large benefit to the host community such as: employment, increasing awareness, knowledge and social acceptance, increasing economic resilience of the communities. Furthermore, a community solar project could create pride of owners that has far-reaching behavioral impacts on all sustainability activities.

Other proven benefits of community solar projects are the increased transparency in planning and construction; broader distribution of assets and influence within the energy system; an opportunity for indigenous people; diversity of actors, implementation of projects that might not be developed by major actors; local energy needs are more likely to be met; increased pool of funders, local ownership increases the number of people and available funds for investment.

Communities can further play a pivotal role in the democratization and decentralization of the energy system around the world. Decentralized energy system are in many cases more resilient to climate change and disasters and more reliable than centralized system. They also sustain fewer network losses. Contrary to the general perception, community-owned companies have also been proven to have the capability not only to provide quality services to their customers, but also to do lower energy prices than commercial energy companies. This is due among other reasons because the expected return on equity of \$0.06 is a lot less lower than companies, and solar are very capital-intensive price.

The community solar is facing many challenges. Among them there are the implementation challenges. Key regulatory challenges mainly comprise lack of access to the energy market and discrimination against smaller investors. The global trend towards auction system has become a serious obstacle for community-based investment, as well as for all the small and medium investors. As a rule, auctions tend to favor larger investors because they

increase the planning risk to a degree that only an investor with a large project portfolio and a strong balance sheet can tackle. In addition, in general community energy projects suffer more from regulatory changes, such as changes in _____ structure because they cannot compensate for losses in all their projects with gains from another project. And they are more vulnerable to the _____ risk.

Financial challenges are related to community's capacity to raise equity and the lack of access to third-party finance. This challenge is of particular significance in developing countries. Although communities may be able to make regular payments for loans from the returns of the energy projects, providing the equity which allow onuses (sp?) and control of the project is a significant _____. So far most established business models have been able to translate expected regular payments and economic welfare gains or even land rights into equity.

The lack of a clear and widely agreed legal definition of community energy and low awareness together comprise a third challenge to the widespread adoption of this approach. Cultural aspect can also hinder the development of community energy. Democratic _____ make it and shared ownership are common practice in some countries. In others it's our challenging practice due to historical events and societal characteristics. In addition, even the best intentional community energy project will not automatically run until the benefits will be distributed equally within the hosting community. This can create tensions within communities and reduce the positive impacts, a way of _____ that community energy projects could otherwise have.

The common forms of community solar projects. Partnerships are generally governed by a management board. Rights are linked to the financial stake of each partner. Partners are usually in charge of day-to-day management decisions with full entrepreneurial responsibility. Local community members may be limited partners and are in this case consulted on key issues.

Co-operative are democratic as true to the follow asset of internationally agreed intervals and make decisions on a one-member one-board basis. Day-to-day operation is governed by an elective board. Co-operatives usually raise the entire project investment through equity. The structure may vary from one country to another. Co-operatives tend to be the most common and natural organizational structure of community solar initiatives. They may be owned by producers, simply consumers, other businesses, the community, or a mix of these.

A community trust or foundation are established to ensure the returns on investment are used for specific local community purposes. They allow for the sharing of benefits from solar projects with those citizens that do not have enough money to invest. Development trusts are enterprises that usually focus on economic environment or other social issues. Development trust may take a number of different forms. A charity, a company limited by want, a community _____ company and in this _____ prominent society.

Not-for-profit customer-owned enterprises are similar to co-operatives, but with special rules. They can limit the power of individuals who own multiple properties by capping _____. This arrangement ensures that the enterprises remains committed to benefitting the local community through reliable and affordable services. In some places this model is applied to community solar power projects that rely on a small or independent gate network.

Housing association and private non-profit organization that can form and are made of different legal restrictions. For example, a housing association may be an industrial provident society, a cooperative society, or a company limited by warranty.

Third-party owned community solar projects are plants will electrify shared by a community. The primary purpose of this sort of community is to allow members of a community the opportunity to share the benefits of solar power, even if they cannot or if they're not installed solar panels on their property. Project participation benefit from the electricity in a _____ community solar farm, which costs less than the price they would ordinarily pay to their utility.

Finally, local governments are important actors in community renewable energy. Engagement in local public utilities is usually related to the representative logic of a state and citizenship. And the concept of municipalization, local government, often in collaboration with community cooperatives, manage and operate—look up what it is to provide a not-for-profit utility service.

New business models are being deployed around select communities. Often community solar members can take advantage without purchasing solar panels. Typically the solar array is owned by a solar company or third-party investor who builds the array on a field or on a large commercial rooftop. The _____ of this array then sells the electricity to members of a community who wants to buy renewable solar energy. A more sophisticated model is MOSAIC, that finance community solar or solar home system with savings of other citizens that invest in this project for a modest interest rate. Community Solar Hub is a web-based platform that brings together projects with citizens.

On the status and trends on solar community projects. As mentioned before, it is very difficult to gather information on the status and trends of solar community projects. I discussed this in the previous section, while there is a consensus on characteristics of a solar community project, there is not an agreed definition. This makes it very difficult to track these projects. In addition, many of these projects are happening behind the counter. There are small, they are not tracked, and there is not any registry. Furthermore, community solar is being deployed mainly under the net-billing and net-metering schemes. There is an increase in number of countries and national level approving this kind of revelations. Without considering the projects that are developed with the main goals to provide access to energy in less-developed countries, we can say that solar communities is mainly happening in North America, Europe, and Australia.

We will look to the United States data from the National Renewable Energy Laboratory in a study from 2016. In 2016 the number of solar community projects in the United States of America were estimated at 108. There is an exponential growth of solar community power. This project involves 70,000 citizens. Total install capacity is estimated at 110 megawatts that produce 230,000-megawatt hours per year.

There is a great potential to reach from these _____ markets. It could represent half of the new US PV market by 2020. Mainly customers can install roof solar, but they'll be willing to develop a solar community project to share the benefits.

In 2016 at least 18 states have enacted or proposed enabling regulations. Nevertheless, enabling regulation is not prerequisite for project development. In 2016, after ten years of the first project 26 states have at least one project. More than half of projects are located in Colorado, Minnesota, or Massachusetts, with 36 per cent in Colorado. On the other hand, almost 70 per cent of solar capacity is located in Arizona and Colorado. About 78 per cent of the projects were smaller than 1 megawatt.

If we're looking to Europe there is a level of 1,500 European energy cooperatives and they gather 1 million citizens who are active in the energy transition. Committing to solar can be found in 11 countries of the European Union. In December 2018 the revised Renewable Energy Directive 2018, 2001, entered into force as part of the Clean Energy for all Europeans package, aimed at keeping the European Union a global leader in renewable energies, and more broadly, helping the European Union to meet its emission reduction commitments under the Paris Agreement. The new directive establishes a new, binding renewable energy target for the European Union for 2020 of at least 32 per cent, with a close of a possible _____ by 2023.

With the _____ community projects directive says that the new renewable directive will also include rights and prohibitions to support renewable energy communities. Member states will also be required to assess the potential and existing barriers to the development of energy communities. To develop frameworks that allow communities to access markets without discrimination and a level playing field. Renewable energy communities will also have a right to set up energy sharing arrangements.

Further mandates of the European directive are member states will need to ensure citizens that are vulnerable benefit from participating in a renewable energy community. Member states must put in place tools to facilitate access to finance and information.

Regarding the status and then trends in a community solar in Australia, in the past 15 years has seen the emergence of a growing community movement in Australia around renewable energies. This has preliminarily been motivated by a desire to take guided and empowering action on climate change at the local level, especially in the context of wavering Australian government policies and support for both carbon pollution and renewable energy over the

same period of time. The community energy sector in Australia has grown from not much more than an abstract concept in 2006 to a point whereby early 2015 there are at least 19 community energy projects operating and at least 59 community energy groups developing, delivering, and operating projects. With almost 10 megawatts of _____ renewable energy assisting us at the end of 2014, the setup is delivering over 50,000 megawatt hours of clean energy each year and avoiding over 43,000 tons of carbon emissions.

The favorite technology option is solar PV, and this ranges from household scale to _____ installation, up to 250 kilowatts. The first community-owned solar farm with a capacity of 99 kilowatts was launched in October 2014. Today there are at least 105 community energy projects in Australia.

Community Power Agency Mission of Australia is for a fair and sustainable energy sector that provides real benefit for citizens and the environment. The Australian agency for community power is specialized in supporting community groups to navigate the complex process of setting up a community-owned renewable energy project. The Community Power Agency mission is to help grow a vibrant community renewable energy sector in Australia through building the capacity of communities on the ground and working collaboratively with other organizations to address systemic barriers facing the sector as a whole. To achieve these goals the Community Power Agency engages in three main areas of work: supporting and building the capacity of community projects on the ground; engaging in sector-level advocacy, collaborating and development; and third, developing resources and doing research.

How it looks the future for the community solar project. A solution of _____ of energy _____, renewable energy becomes more important to the continued prosperity of our world. Solar farms can provide cheap, clean, consistent, and conflict-free power all over the world. While private installation will continue to be a good option for land and business owners, community solar farms are a better option for the average energy user: renters, lower-income residents, and those whose land simply won't accommodate solar panels will still be able to enjoy a cost-effective renewable energy source with a community solar installation. This increase in demand will drive innovation, lower cost for everyone, and support a healthier environment for us all.

Taking into consideration the main characteristics of the sustainable energy transition that the world is pursuing since recent years, decarbonisation, decentralisation, digitalisation, and democratization, it is as clear that community solar will play a critical role in the solar revolution.

On policy recommendations to maximize value of community solar projects, there are five key super strategy areas that identify as needed to be addressed in order to grow the community solar energy sector. First one, community energy models, the strategies to address in case the accessibility if a system viable community energy models create an environment that encourage and fosters innovation and development of new community energy models. Second, regarding finance and funding, the _____ of the strategy are increase the availability and accessibility of funding finance that community energy

projects need to point where they are operating. _____ the use cost of community energy projects to increase their economic viability. Maximize revenue stream available to community energy projects, secure liquid resources for community energy support providers.

Third, on capacity building strategy to develop for our community we'll have these following objectives: develop the community energy sector into a vibrant, robust highly-skilled and adaptable sector. Field capacity from within through an _____ innovative communication working on a skills development initiative.

The solar committee _____ to address the profile raising and the stakeholder support by increasing key actors' awareness of community energy and its benefits, assist community energy groups to communicate the benefits to the local community and the wider public.

Finally and a successful strategy for community solar must propose policy and regulatory reform. First, set a policy and regulatory environment that proactively remove barriers to support the growth of the community energy sector to reach its full potential. Last but not least, solar community energy strategy should be included in original development strategies to make clear the link between solar energy and _____ challenges such as energy poverty, energy scarcity, and unemployment.

Legal frameworks and regulation. Local authorities can require a minimal level of community involvement in energy investors by amending planning regulations. Energy strategies should be amended to include targets for community energy, indicating long-term commitment. Studies will define community energy, but the point of limiting definitions that could prevent all possible legal forms from being used. National and regional governments who explore current barriers to community energy structures, develop regulations to address legal, financial, and administrative barriers, for instance, empowering consumers and communities to actively participate in the electricity market and generate, consume, and sell electricity back to the grid, taking into account the costs and benefits of the operation's market participation for the system as a whole. Adaptation of connection to grid integration or relation, promoting energy demand management thanks to new technology, like smart homes, smart appliances, and smart meters in combination with electricity supplied in _____ prices, concepts that consumers will be in tight _____ with a smart meter from their supplier, promoting consumer's engagement with an aggregator by establishing a relative framework that makes it easier for an aggregator to operate in the market.

Promoting a solar technology by making its benefits for an aggregate pricing; this will allow its flexibility and usage to be adequately _____ related. The solution of scarcity pricing and the extension of the pricing that are all measures of potential bought longer-term investment in the technology.

On finance. Financial support, such as project development grounds for low-interest loans should be provided to groups who are interested in building

community projects to enable them to perform to civility status and access to consumer _____ services. A key driving force behind the measures of energy communities in Germany has been access to conscious fee-in tariffs that obtain a minimum purchasing price for energy from renewable sources. Energy communities will be explicitly support and assisting support the scheme with minimum barriers to involvement. Although it may not be possible at the municipal level, investment of tax relief can be granted to community energy projects. Relief can also be applied to charges on consumption of energy.

Public procurement can be used to support community energy development. _____ for energy _____ can apply a minimum requirement for community _____ of shares and _____ could preference community-run models for provision of energy to public building and infrastructure adjusted lighting _____ _____ to heat.

On expertise and guidance, regional authorities can organize workshops and educational efforts to build capacity for the creation of community energy organizations and can support the training of individuals for managing and maintaining renewable energy technologies. Authorities can also show that expertise is available when needed by community developers by providing the information _____ dedicated to community energy development. This can be the only house or through development of independent organizations, such as community energy agency, local government departments would be available to help community energy planners with regulatory issues such as land use, planning, permitting, and environmental regulation. Authorities can develop rooftop solar maps, assessing the physical, technical, and economic potential for each roof in the community.

Finally, on awareness raising. Regional policymakers can lead the way in communicating about the benefits of community energy, highlighting not only the economic benefits for those who get involved, but also the broader associated channels that could be overcome. Public authorities can help to kickstart the process of community energy development by performing a regular assessment of renewable source's availability and demonstrating that there is potential return on investment. The assessment should also include a mapping of relevant stakeholders and those with _____ capacity to assist in community energy development. Public authorities can mandate their energy agencies or other suitable players to create a platform that can gather citizens to inform them about community energy and enabling their discussion.

And this is the part where we come to a conclusion of the most important information which we collected today in this presentation.

We can conclude that community solar cannot be considered anymore anecdotal, but a global movement. The decrease in the cost of the photovoltaic technologies, the increasing awareness of citizens, the development of new business models, and the implementation of supportive legal and regulatory frameworks are the reasons behind this exponential growth of solar communities in the last years. The community solar projects

bring multiple benefits to the citizens and the communities that host these projects. Nevertheless, they still face multiple legal, financial, technical, and administrative barriers.

At this point we come to the end of the module and all my _____ value change community solar. I would like to thank you for your attention. As before, you are invited to test your understanding of the concepts in the following small quiz. Thank you very much.

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