

Myths and Misconceptions of solar energy

In partnership with the Clean Energy Solutions Center (CESC)

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01.05.2019

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ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

Overview of the expert

Factor is an international group, specialized in providing global, innovative and sustainable solutions in areas such as climate change, energy, sustainability, trading and innovation.

Our key value is our people. We have offices in six countries, where our interdisciplinary team works for public and private stakeholders, international organizations and non-profit entities.

Our own history and experiences are based on constant innovation. This helps us target our services, by combining academic knowledge, technology and practical experience.

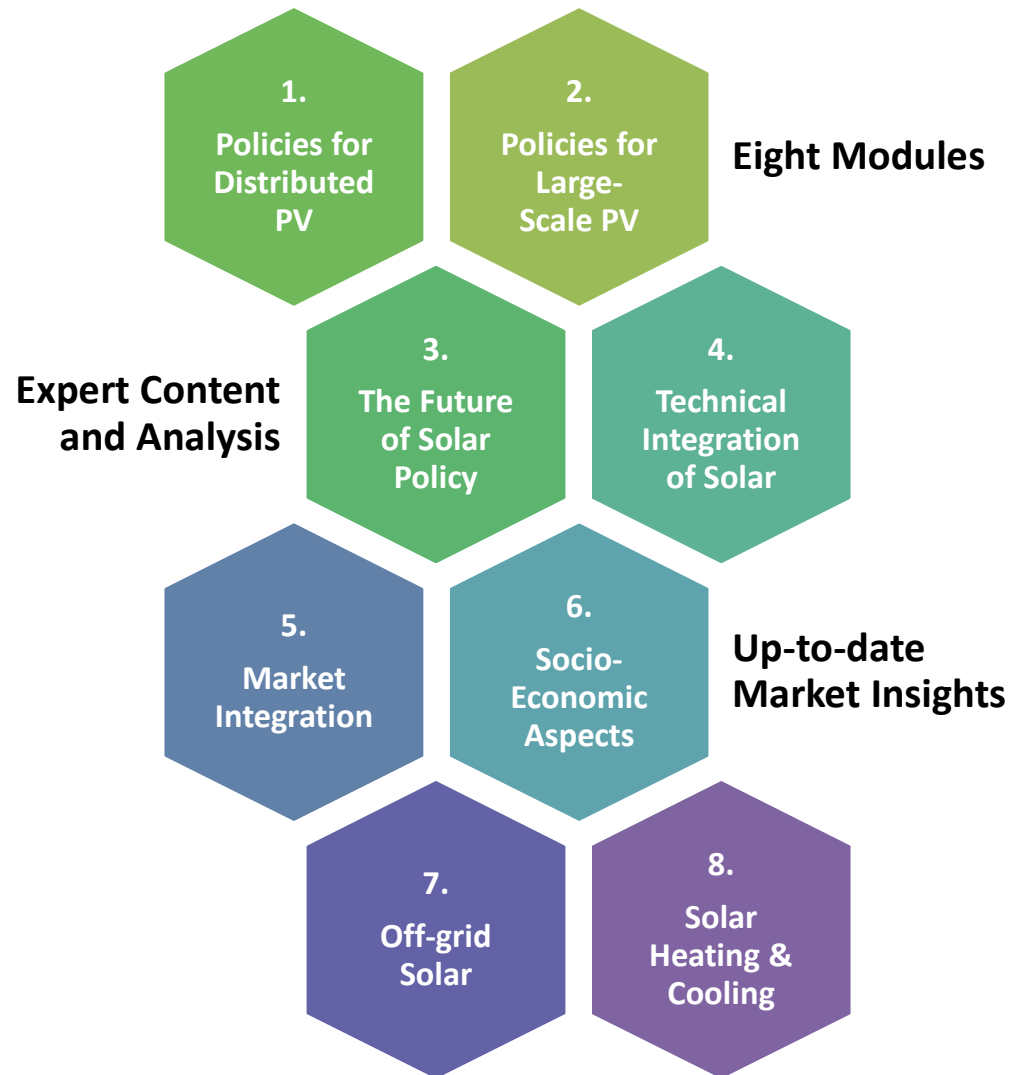


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Training Course Material

This Training is part of Module 6, and focuses on debunking the solar myths



Overview of the Training

- 1. Introduction: Learning Objective**
- 2. Understanding Myths**
- 3. Main body of presentation**
- 4. Concluding Remarks**
- 5. Further Reading**
- 6. Knowledge Check: Multiple-Choice Questions**

1. Introduction: Learning Objective

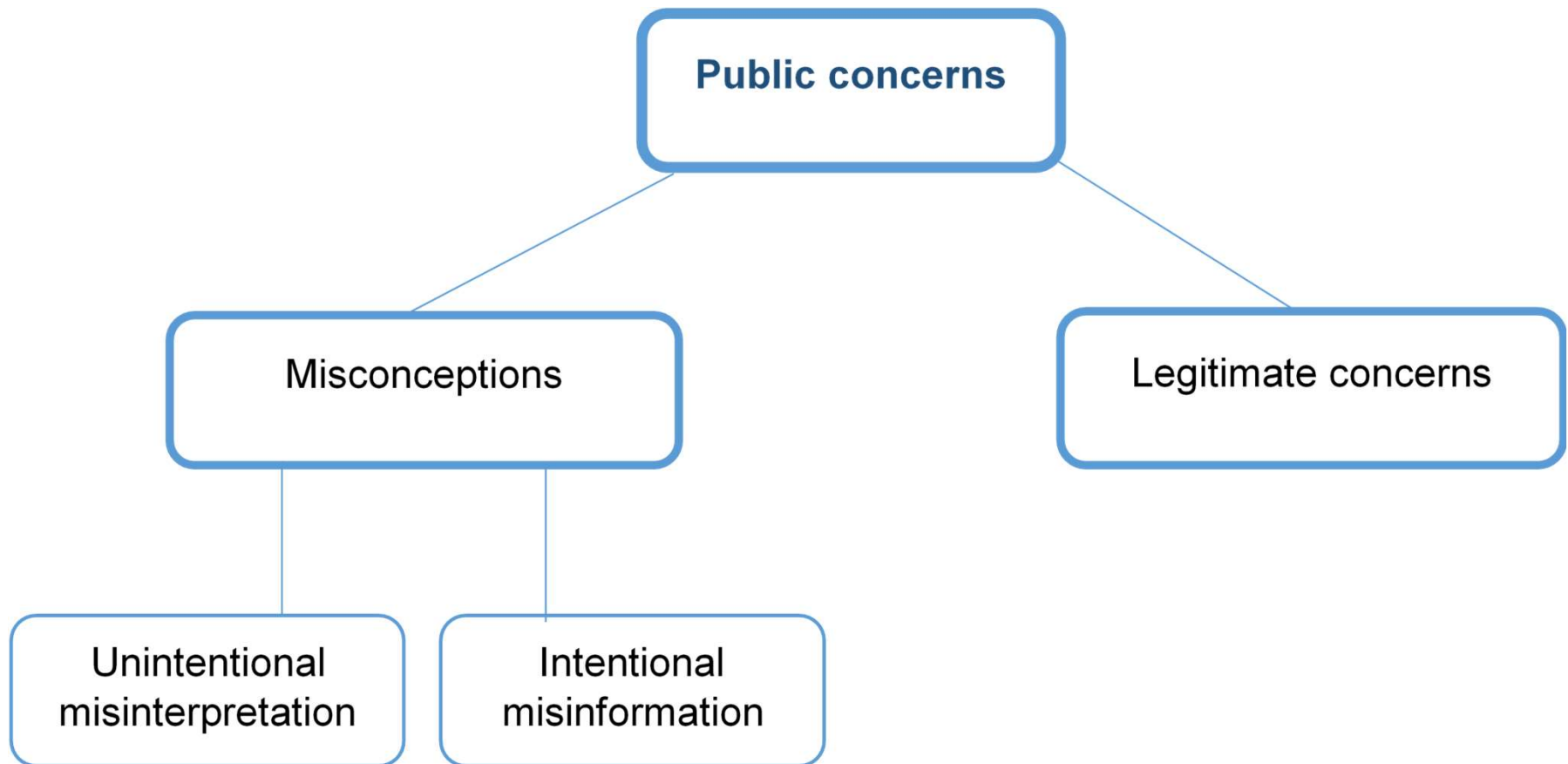
Learning Objective

This module provides:

1. An understanding of the myths and misconceptions of solar energy.
2. An overview of the main myths around solar energy.

2. Understanding Myths

Understanding what a myth is



A myth is a widely held but false belief or idea.

3. Main Body of Presentation

Main Body of Presentation

1 Myths about concentrated solar power

2 Myths about photovoltaic

Myths about CSP technology

CSP is too expensive and it will always be so

The fact is that:

Prices for electricity produced by today's CSP plants fill the range from 12 to 16 c€/kWh depending on the irradiation level and most importantly on the financing conditions.

A remarkable cost reduction – around 50% – has been achieved by CSP since 2007 with only approximately 4.5 GW installed worldwide. Compared with the current situation of Wind (350 GW) and PV (130 GW), one can easily figure out the real potential for cost reduction in the next years of CSP plants.

Myths about CSP technology

CSP plants are an intermittent way of generating electricity

The fact is that:

CSP plants are today in most cases equipped with a heat storage system. During sunny hours the collected solar energy is used not only to provide steam to the turbine but also to charge the thermal storage tank. Then, after sunset or during cloudy periods the energy can be drawn from the storage tank to deliver energy – on demand.

Myths about CSP technology

CSP is not a mainstream energy source in Europe

The fact is that:

According to the 2014 edition of IEA's Technology Roadmap for CSP, the estimated production of CSP reach about 1000 TWh by 2030 and 4380 TWh by 2050, thus providing 4% of the electricity mix in Europe and 11% of global electricity mix. In other words, this will be a significant share in the energy mix.

Myths about CSP technology

Support programmes for CSP deployment are expensive and inefficient for the economy of the countries

The fact is that:

CSP investment creates more than 10 times more employment (and social wealth) per MW than the same investments in fossil-fuel power generation.

Myths about CSP technology

CSP plants disrupt landscape

The fact is that:

CSP power plants tend to be located at abandoned industrial sites, on rural land and in deserts to lower the impact of land use and land disturbance.

Myths about CSP technology

CSP power plants need too much land

The fact is that:

The electricity yield of solar technologies per unit of land is in the order of magnitude of other technologies.

Myths about CSP technology

CSP power plants need much water

The fact is that:

CSP plants require less water per hectare than agricultural activities as this was assessed in the south of Spain.

Myths about CSP technology

CSP is a not-yet mature technology and thus not reliable

The fact is that:

CSP plants have proven their reliability since the 1980s as the first commercial-scale application, the Solar Energy Generating System (SEGS) with 9 separate sites continues to operate and produce 350 MW of installed capacity – enough to power nearly a quarter of a million homes at peak production. In other words, CSP plants have a lifetime of more than 30 years with minimum performance losses.

Myths about CSP technology

CSP industry is falling

The fact is that:

CSP industry is rather booming worldwide. Since 2010, generation of solar thermal electricity from CSP plants has grown strongly worldwide.

According to International Energy Agency (IEA), the prospects for the development of CSP plants are extremely high. The forecast of CSP production could reach about 1000 TWh by 2030 and almost 4500 TWh by 2050 at world level, thus providing 4% of the electricity mix in Europe and 11% of global electricity mix.

Myths about CSP technology

CSP is very complex technology

The fact is that:

CSP power plant is not that complex, although CSP plants are like mechanical watches with many parts and components to be optimized.

The electrical part of CSP plants uses common, simple conventional power generation parts and devices – just the solar field is specific.

Myths about CSP technology

CSP plants endanger wildlife.

The fact is that:

In Europe, there is no case about endangering wildlife at all and the news in other countries related to birds death are exaggerated.

Myths about CSP technology

Countries may be better off starting a CSP program later (after 2020 or so...)

The fact is that:

A support programme for CSP will provide immediate positive returns to the economy of any given country – in terms of GDP increase, employment and taxes – right from the starting up of the construction phase, while the first premiums will be paid some years later.

Myths about CSP technology

CSP companies – along the whole value chain – are making huge profits due to incentive measures (feed-in-tariffs or feed-in-premiums)

The fact is that:

As the CSP plants have high CAPEX, most of them were financed with a high leverage, so that the banks are the entities that currently make most profit from the CSP deployment.

Main Body of Presentation

1 Myths about solar thermal energy

2 Myths about photovoltaic technology

Myths about PV technology

The space requirement of a solar panel system is too high

The fact is that

It is not necessary to provide large contiguous areas for a solar panel system. The advantage of the photovoltaic solar energy is the possibility of the **decentralization**.

Roofs, house fronts, noise protection walls, canopies of traffic routes, etc. can be used. Therefore, there are **no area problems**.

Myths about PV technology

The output of solar PV system is not sufficient for the large power consumers

The fact is that:

With a decentralized power supply, a large number of solar PV plant provide the required power.

Myths about PV technology

The conditions for solar PV plants are good only in southern countries, where the sun shines sufficiently

The fact is that:

Also in Central Europe and North America, the conditions for solar PV plants are good.

Myths about PV technology

Photovoltaic solar power is worthless because it only occurs when the sun shines.

The fact is that:

Solar PV systems provide electricity not only in direct sunlight but also, from a bright sky.

Even during the day, there is a higher demand on the electricity grid (peak pricing hours). Photovoltaic solar power, which is fed into the utility grid, contributes to cover the peak loads at midday. Heavy usage of electricity in peak consumption periods will be more expensive.

Myths about PV technology

Solar panels need a solar tracker system to follow the sun during the day.

The fact is that:

The solar panels are always oriented to the south, which coincides with the hours of higher solar radiation.

Nevertheless, installing a solar tracker will increase the power output.

Myths about PV technology

High environmental impact by chlorine chemistry and problems in disposal

The fact is that:

Photovoltaic solar cells consist of non-toxic silicon, the second most widely used element on the earth's surface. Chlorine is only used when cleaning silicon. This takes place in closed cycles.

The finished product, the photovoltaic solar cell, does not include chlorine compounds.

Myths about PV technology

Solar PV systems cause additional electric smog

The fact is that:

“Electric smog” is a collective term for high-frequency electromagnetic waves. However, electromagnetic waves are not created through direct current.

Photovoltaic solar cells produce direct current, but this current is just in the solar power inverter converted into the standard alternating current.

Myths about PV technology

Photovoltaic-generated electricity is more costly than electricity generated by fossil-fueled or nuclear-powered electricity.

Photovoltaics, unlike other power generators, can only survive with subsidies

The fact is that:

The rapid deployment of solar PV, working in combination with high learning rates (for every doubling of cumulative installed capacity PV module costs decline by 20–22%) has led to dramatic cost declines in the last 10 years. Crystalline silicon (c-Si) PV module prices have fallen by more than 80% since 2010, driving reductions in installed costs. Utility-scale solar PV projects can now provide electricity that is competitive with other grid supply options, without financial support.

Myths about PV technology

Solar cells require more energy for their production than they generate.

The fact is that:

Under the most trying conditions, it takes no more than three years of operation for solar cells to pay back the energy that goes into making them.

As they will last for many decades, their energy payback is extremely short.

Myths about PV technology

Solar Panels will cause the roof to leak, deteriorate, or collapse

The fact is that:

Solar panels actually protect and preserve the portion of the roof they cover. If there's ever a problem with the roof that needs to be repaired, panels can easily be removed. Most solar panels are not attached directly to the roof itself, but rather to a mounted railing system.

Myths about PV technology

Solar panels need constant maintenance.

The fact is that:

Photovoltaic solar panels are manufactured to be outdoors and withstand adverse weather conditions for many years.

Its manufacture is strong and for this reason the manufacturers offer guarantees of many years in their panels. Its maintenance is minimal and will be limited to clean dust and dirt the surface of the solar panel once a year and check that the solar cables are still well connected.

4. Concluding Remarks

Concluding Remarks

1. Vested interest from the conventional energy companies has fed citizens with misinformation about solar energy technologies.
2. Myths about solar energy persist due to the efforts of the conventional industry to reinforce these myths, the complexity of the topic not always easy for the citizen and the lack of an strategy from the solar industry to communicate better.
3. Myths on solar energy are related with many aspects: reliability, economic, environmental concerns etc. There are facts to debunk these myths.
4. Legitimate concerns have been addressed by the solar community by applying good practices to reduce potential damages.

5. Further Reading

IRENA (2013): Workshop: Social Acceptance of Renewable Energy. Website homepage:
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ESTELA (2015): Debunking Myths About Solar Thermal Electricity. Available at:
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Clean Energy Council (2013). Solar PV Myths And Facts. Available at:
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WWF (2013): Busting The Myths: Debunking myths about renewable energy. Available at:
https://d2ouvy59p0dg6k.cloudfront.net/downloads/busting_the_myths_low_res.pdf

6. Knowledge Checkpoint: Multiple Choice Questions