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# Exploring Solar Opportunities in Haverford Township

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# Overview of Presentation:

- Introduction and Background
    - 360 Program and Germany
  - Social benefits of Solar
  - Solar capacity of CREC and Skatium
  - Financing the CREC and Skatium installation
    - Township Ownership vs. Power Purchasing Agreement
  - Looking to the Future
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# Background

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# Our Background

## Climate Change 360 Program



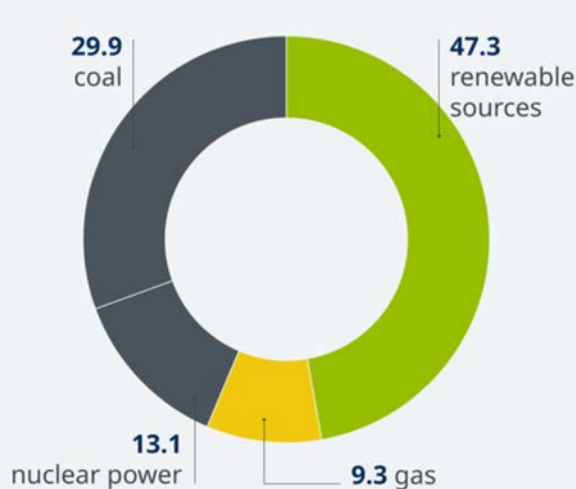
## Freiburg, Germany



# Germany Case Study

## Net electricity production in Germany

January - July 2019, numbers in percent

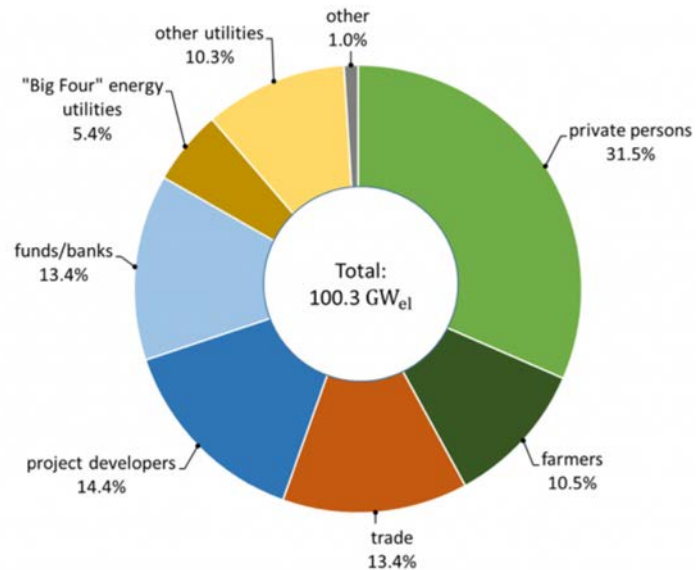


Source: Fraunhofer ISE, the missing 0.4% are generated by oil and other energy sources

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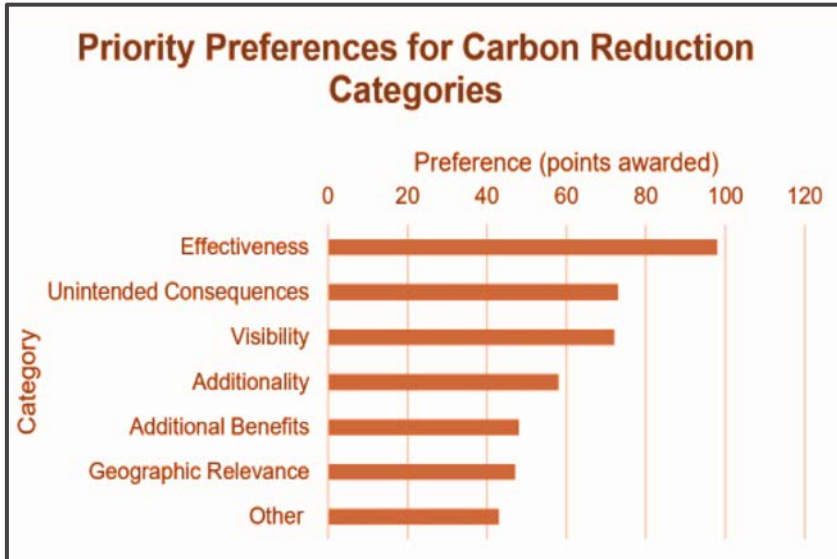
## Ownership structure of installed renewable power generation capacity in Germany 2016.

Data: trend:research, AEE 2017.



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# Bryn Mawr College Carbon Reduction Priorities



*Effectiveness is important, but so too  
are the other positive impacts of  
initiatives*

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# Social Benefits of Solar

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# Awareness & Community-Building

- Continuing the Township's Green Initiatives
  - Sierra Club Ready for 100 Campaign
  - Complement clean-energy aspects of CREC
  - Rain garden programs
  - Township Climate Action Plan
  - LED Street lights



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# Awareness & Community-Building

- Community Engagement
    - Opportunity for community voices and businesses to be part of planning process
    - Fundraising opportunities
    - Strengthen community pride and interest in solar opportunities
      - Private home solar & opportunities for local installers
        - “Our customers are our best marketers”
      - Working with local students
      - Promoting local businesses
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# Social Benefits of Local Solar Energy Production

- These two projects reduce CO<sub>2</sub>e emissions by **187 mt a year**
  - Similar to **removing 41 cars** from the road per year
  - Social cost savings of **\$11,220** a year
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# Solar Capacity of CREC and Skatium

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# CREC Center

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# Prior 360 involvement with the CREC

*Cost-Benefit Analysis of Geothermal System  
for Commissioners (2011)*



- Successful installation of Geothermal System
- Help secure **\$300,000** grant from the Pennsylvania Energy Department Authority for system
- System will save over **\$2 million dollars** and greatly shrink the CREC's carbon footprint over its lifetime

# Building on the Green Initiatives of the CREC



- LEED Gold Certification
- Geothermal heating/cooling
- Environmental Education Center

## Mission Statement:

**...The mission of the CREC is to create a healthier environment and healthier individuals through education and programs. We believe the health of our community is directly related to the quality of our air, water and open spaces as well as the food we eat, the condition of our bodies and how we think...**

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# Solarizing the CREC Roof



INDEPENDENCE SOLAR

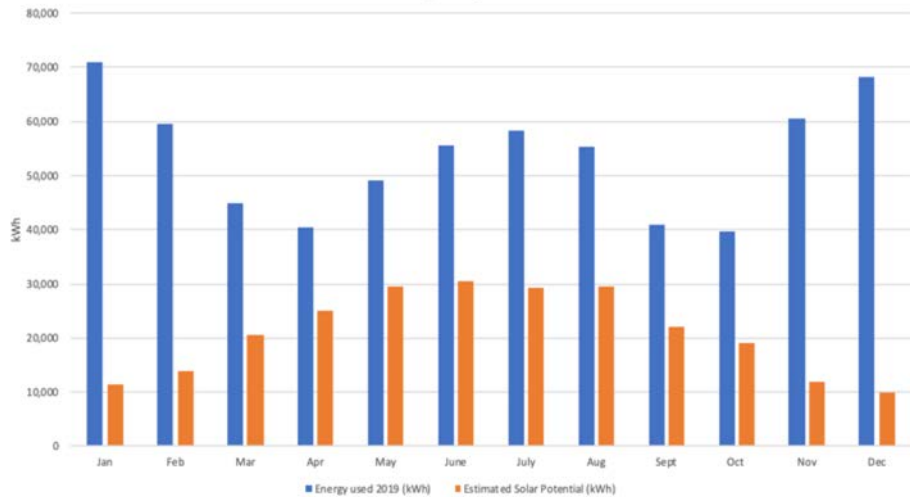
## Independence Solar Evaluation:

Excellent solar  
potential on all three  
roofs with near  
complete roof  
coverage

South facing roof with  
very good shade  
profile → ideal for a  
solar installation

# Solarizing the CREC Roof

Current CREC Energy Usage vs. Solar Potential



## Fast Facts

- The 516 panel installation would generate 206 kW capacity and could create an estimated **252,132 kWh** of energy per year
  - Equivalent to the energy usage of about **23 residential homes**
- **98.8%** solar access rating
  - Ideal positioning and shade profile
- ~**39%** of the CREC's yearly energy demand would be supplied by rooftop panels



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Skatium

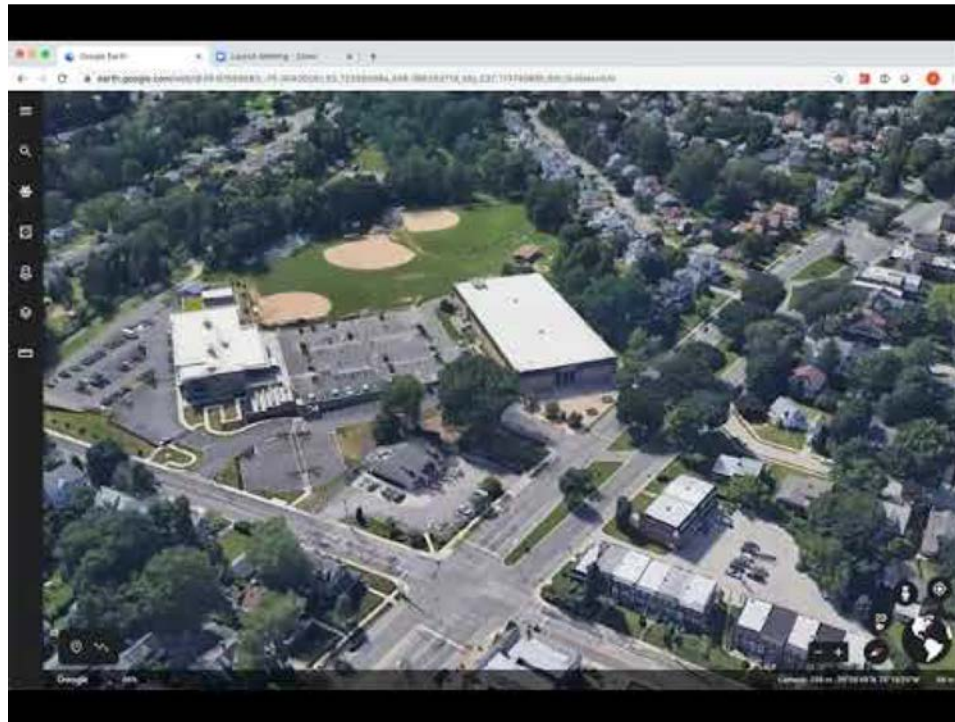
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# Skatium



# Skatium Roof fly-by:

<https://www.youtube.com/watch?v=wR1DAIgd8jQ>



# Solar Potential for Skatium Roof

- **658** solar panels at 400 W each
- **263 kW** capacity
- Minimal/no shading
- Annual capacity of **321,000 kWh**
  - Equivalent to 29 households

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# Financing the CREC and Skatium Installations

# Potential Cost and Ownership Structures for CREC & Skatium Rooftop Solar

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**Township  
Ownership of  
Array**

**3rd Party Power  
Purchasing  
Agreement (PPA)  
of Array**

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# Township Ownership

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# Township Ownership Structure

- Township would foot entire cost of installation and lifetime maintenance of the panels
  - Township would own panels and all energy they created
  - Township would not receive federal tax credit (26%/22%) on installation cost
  - Less common approach for municipal arrays
  - Township would receive **Solar Renewable Energy Certificate** (SREC) value of energy
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# What's the Cost for CREC?

- Total Estimated Capital Cost for Solar Panel installation:  
**\$2,000 per kW capacity** for 200 kW array = ~**\$400,000**
  - Expected Maintenance Costs: **\$2,000 per year**
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# CREC Roof

## 8 cents/kWh

- Electricity Savings: **\$20,200**  
@ **8 cents/kWh** (present CREC rate)
- SREC value **\$8,800**  
@ **3.5 cents/kWh**
- Yearly savings of **\$29,000**
- Estimated Payback Period:  
**15 years**

## 6.5 cents/kWh

- Electricity Savings: **\$16,400**  
@ **6.5 cents/kWh**
- SREC value **\$8,800**  
@ **3.5 cents/kWh**
- Yearly savings of **\$23,200**
- Estimated Payback Period:  
**18 years**

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# What's the Cost for the Skatium?

- Total Estimated Capital Cost for Solar Panel installation:

\$2,000 per kWh for 263 kW array = **\$526,000**

- Expected Maintenance Costs: **\$2,000 per year**
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# Skatium Roof

## 8 cents/kWh

- Electricity Savings: **\$25,700**  
@ **8 cents/kWh** (present CREC rate)
- SREC value **\$11,250**  
@ **3.5 cents/kWh**
- Yearly savings of **\$34,900**
- Estimated Payback Period:  
**15 years**

## 6.5 cents/kWh

- Electricity Savings: **\$20,900**  
@ **6.5 cents/kWh**
- SREC value **\$11,250**  
@ **3.5 cents/kWh**
- Yearly savings of **\$30,100**
- Estimated Payback Period:  
**17.5 years**

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PPA

Ownership

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# PPA Ownership Structure

- 3rd party investor would own and operate the panels on the roof
    - Investor would cover all installation costs and yearly maintenance expenses
    - Investor would receive **26%/22% federal tax credit**
  - ***No upfront cost for the Township***
  - Township would purchase electricity generated by panels from the investors at a fixed price (Set by investor at onset of the project)
  - More common approach for municipal installations
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# PPA Structure

## What's the Cost?

- **NO** installation or maintenance costs
- Purchase electricity generated via third party investor at **fixed price** (ideally at or below current electricity costs??)
- Would not directly own panels

## What's the Benefit?

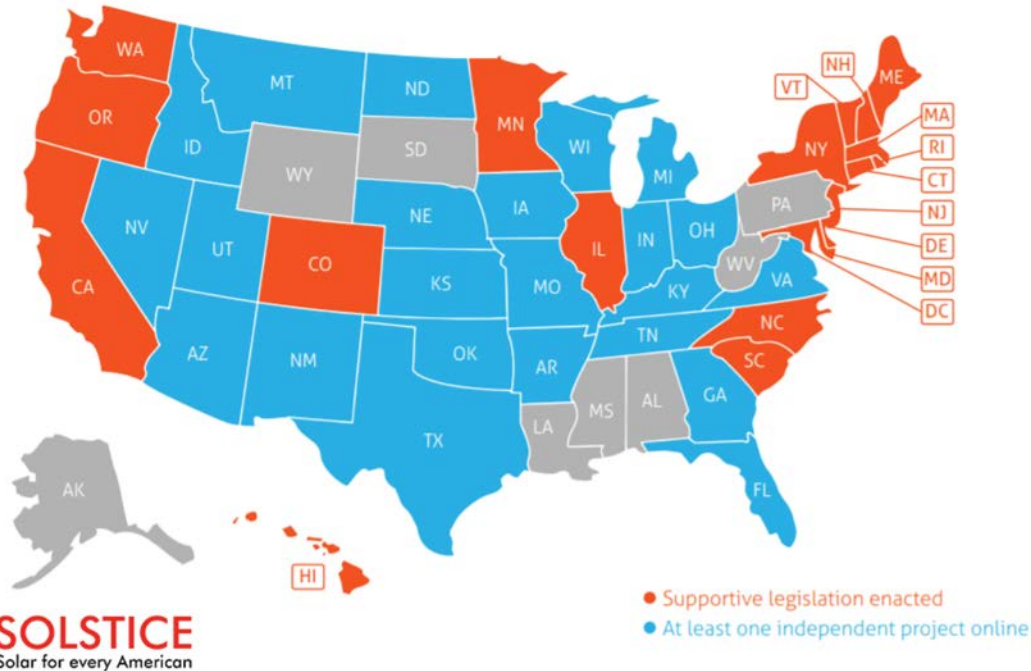
- Major **decrease in risk** & financial commitment associated with the project
  - No long term maintenance costs
  - Potential for community members to act as investor(s)
    - Naming Rights
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# Looking to the Future



# Community Solar



- **20 states** currently have legislature promoting community solar
- **2 bills** are sitting in Harrisburg that would be vital to making this project more financially viable
  - Community solar
  - Increasing value of Renewable Energy Credits (RECs) & Alternative Energy Credits (AECs)

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# Increasing the Price of SRECS in PA

- Current price is 3.5 cents per kWh (\$35 per MWh)
  - In NJ SRECs are valued at 27 cents per kWh (\$217 per MWh)
  - Increasing the price would increase the profits of third party investors
    - Lower fixed cost for the purchaser
    - The cost for the township could be in the 4-6 cent per kWh range depending on the value of the SREC
  - Keep in mind that the tax credit for solar projects end in 2022, so waiting for this bill to pass may alter these calculations
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# Community Solar

- Increased SREC values would benefit community solar projects too
    - Residents who are now paying about 13 cents per kWh would see a drastic decrease on their electricity bill
  - The township could lease out their roofs to community installations
    - \$5,000-\$10,000 per roof
  - Strong community engagement could facilitate the extra work necessary
    - Having a community champion is vital
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# Conclusion

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# Conclusion

- Solar energy is an exciting and realistic opportunity in Haverford Township
  - The benefits of solar extend far beyond their financial savings for the Township
    - Continuing the Township's green initiatives
    - Community engagement & fundraising opportunities
    - Supporting local business
  - The Township has two viable options to go about installing the panels
    - Ownership of panels vs. PPA
  - Potential Community Solar & SREC legislation can help make the panels an even more worthwhile investment
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# Questions/Discussion

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