Canadian Renewable Energy Association
WIND. SOLAR. STORAGE.

Association canadienne de l'énergie renouvelable
ÉOLIEN. SOLAIRE. STOCKAGE.

Community Energy Association

Relay Education

Renewable Energy 101

Workshop at the Indigenous Resource Opportunities Conference

Presented by:

- Patricia Lightburn, CanREA
- Ryan Gander, Relay Education
- Rob van Adrichem, Community Energy Association

Facilitators

Patricia Lightburn, Canadian Renewable Energy Association

Patricia is the Director of Policy for British Columbia at the Canadian Renewable Energy Association, Canada's national organization for wind, solar and storage

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Ryan Gander, Relay Education

Ryan works as a facilitator for Relay Education, a Canadian charity delivering hands-on education and training about renewable energy, energy efficiency, climate change and green careers in school classrooms.

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Rob van Adrichem, Community Energy Association

Rob is CEA's director of external relations and facilitator for the Northern BC Climate Action Network (NorthCAN), a unique platform to share information about northern initiatives and build connections between northerners who identify, influence, and implement local projects that reduce emissions and boost local economies.

rvanadrichem@communityenergy.ca

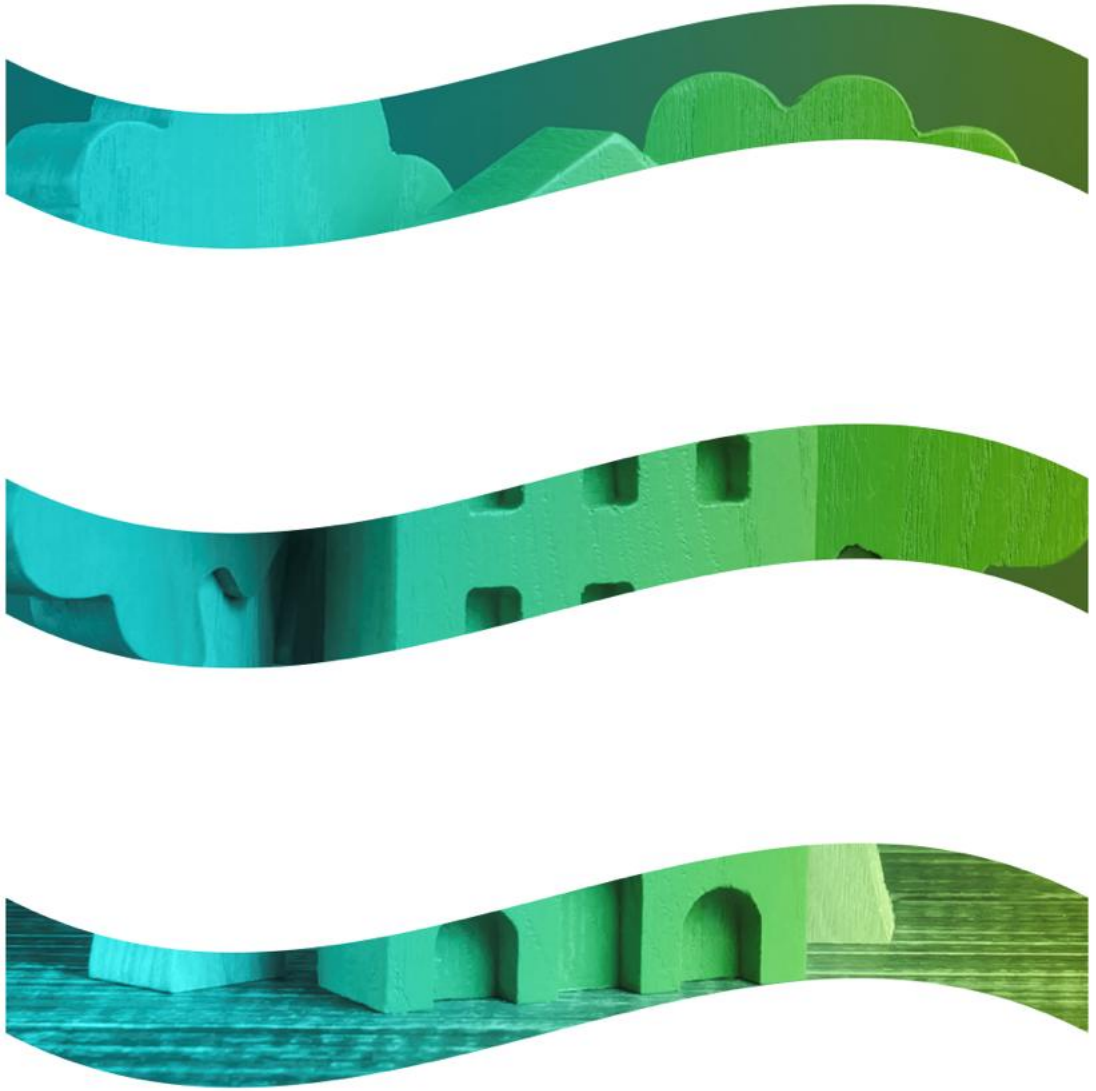
Who is in the room?

Please introduce yourself, your organization and why you are interested in learning more about renewable energy.

Agenda

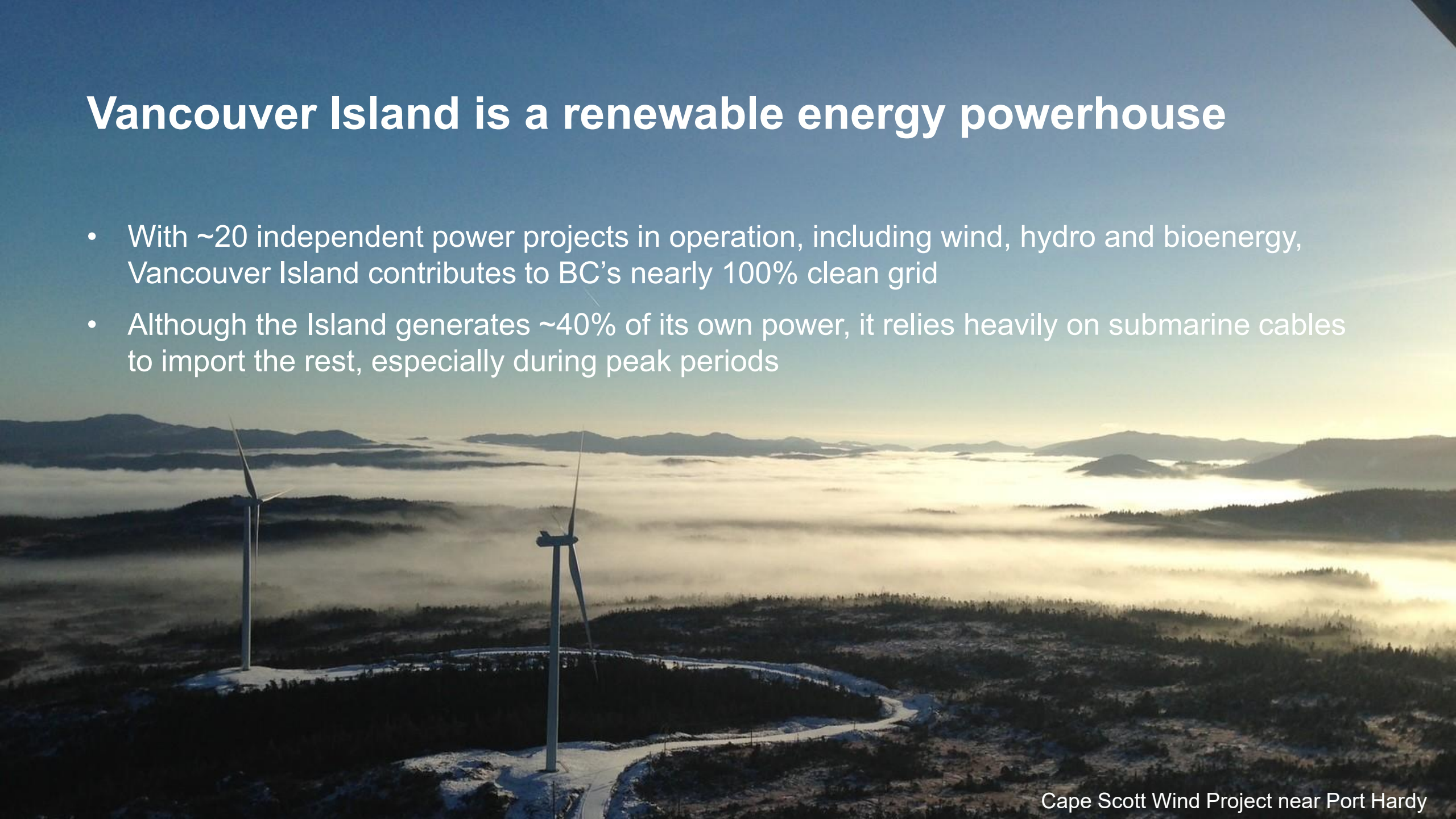
Topic	Time
Introductions	10 – 10:15
Renewable Energy and the BC Context	10:15 – 10:30
Solar Energy	10:30 – 11
Wind Energy	11 – 11:30
Myth-busting Quiz	11:30 – 11:45
Wrap up	11:45 – 12

Renewable Energy and the BC Context



Vancouver Island is a renewable energy powerhouse

- With ~20 independent power projects in operation, including wind, hydro and bioenergy, Vancouver Island contributes to BC's nearly 100% clean grid
- Although the Island generates ~40% of its own power, it relies heavily on submarine cables to import the rest, especially during peak periods



Cape Scott Wind Project near Port Hardy

First Nations communities are at the forefront

As **co-owners and developers** of wind, solar and hydro projects, First Nations communities are contributing to the Island's clean power supply and generating stable revenues for communities

Kwikwasut'inuxw Haxwa'mis First Nation (KHFN) solar project on Gilford Island (by Charge Solar)

The next chapter for renewable energy in BC

- BC's electricity demand is projected to grow by **20% by 2030** and double by 2050
- To help meet that demand, BC Hydro launched two competitive procurement processes and has signed contracts with 13 wind and 1 solar project.
- One contracted project is located on Vancouver Island and more are in development
- BC Hydro's new community generation program is also expected to unlock new projects up to 2 MW in size

Contracted new wind project on Vancouver Island:

- Project Name: Yəyus Energy
- Size: 197 MW
- Location: Near Campbell River
- IPP Partner: Capstone Infrastructure
- First Nations Partner: Wei Wai Kum First Nation

Permitting

- Projects must obtain applicable permits, including from the BC Energy Regulator, prior to construction
- Key regulatory requirements are described at www.windandsolarbc.ca

BRITISH COLUMBIA ENERGY REGULATOR

The BCER is responsible for regulatory oversight of the full lifecycle of wind and solar projects >5MW to:

- ensure public safety
- protect the environment
- support reconciliation with Indigenous peoples
- foster a sound economy and social wellbeing.

- What's Next?
- **Projects are expected to begin construction in 2027 – 2030**

1

Project development, community consultation and permitting

- 1 to 3 years

2

Construction

- 1 to 2 years

3

Operation and maintenance

- 30+ years

4

Repowering or decommissioning and site restoration

- 2 to 3 years

Jobs

A large wind or solar project creates approximately 150 job opportunities during development, construction and operation phases

Land survey	Logging	Concreate and aggregate supply	Environmental monitoring
Equipment transport	Construction of substation	Road construction	Excavation
Power collection & comms networks	Assembly of wind turbines	Professional services	Materials transport
	O&M services		

Where to find more information?

Wind & Solar BC

Wind and Solar BC is a new initiative of the Canadian Renewable Energy Association that is providing clear, current, and accurate information on clean-power projects planned for British Columbia and fostering candid conversations about their impacts and opportunities.

Visit our site (www.windandsolarbc.ca) to learn about planned projects and sign up for updates.

Questions?

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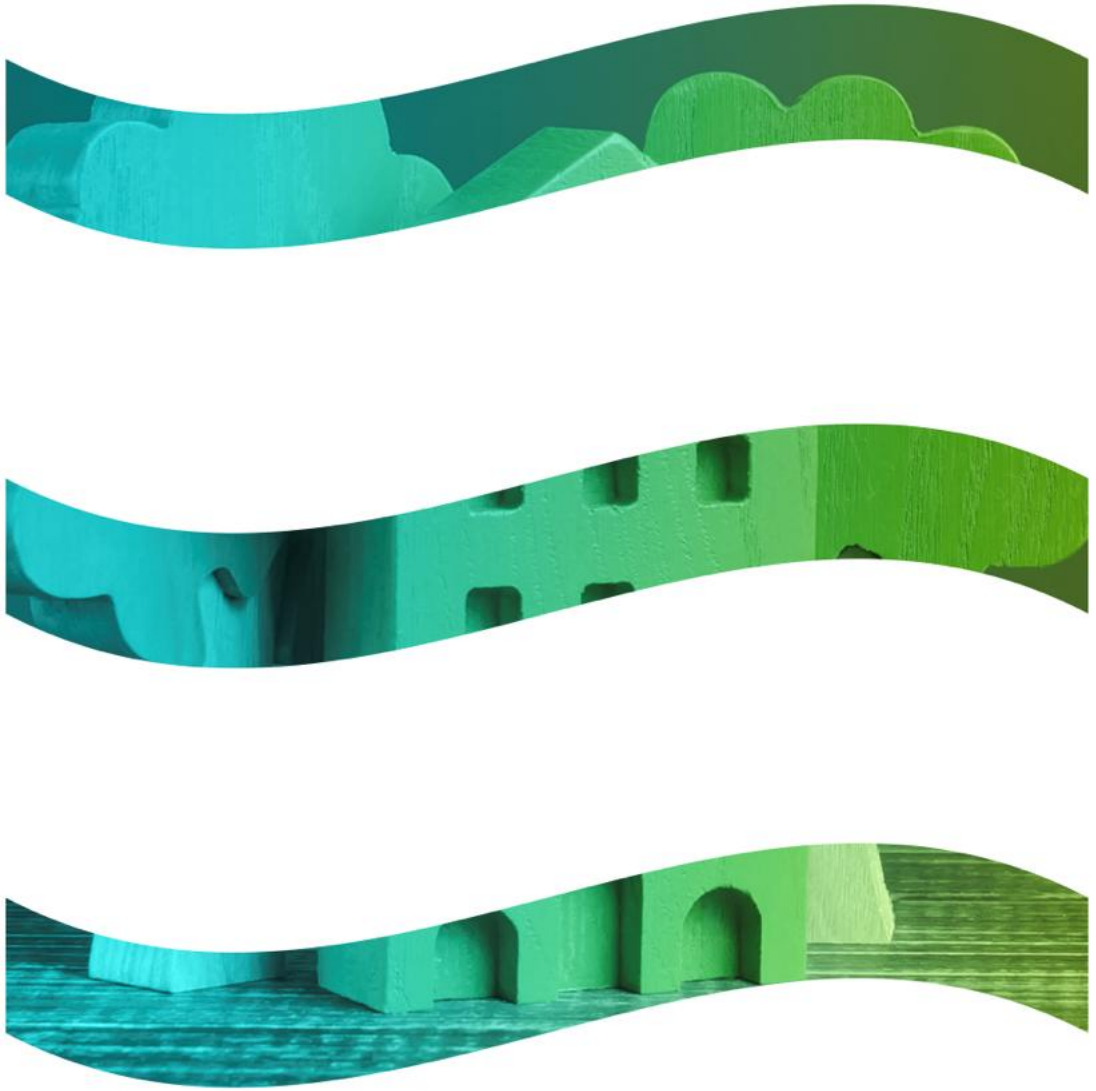
Solar Energy 101

10:30 – 10:45



Solar - Technologies

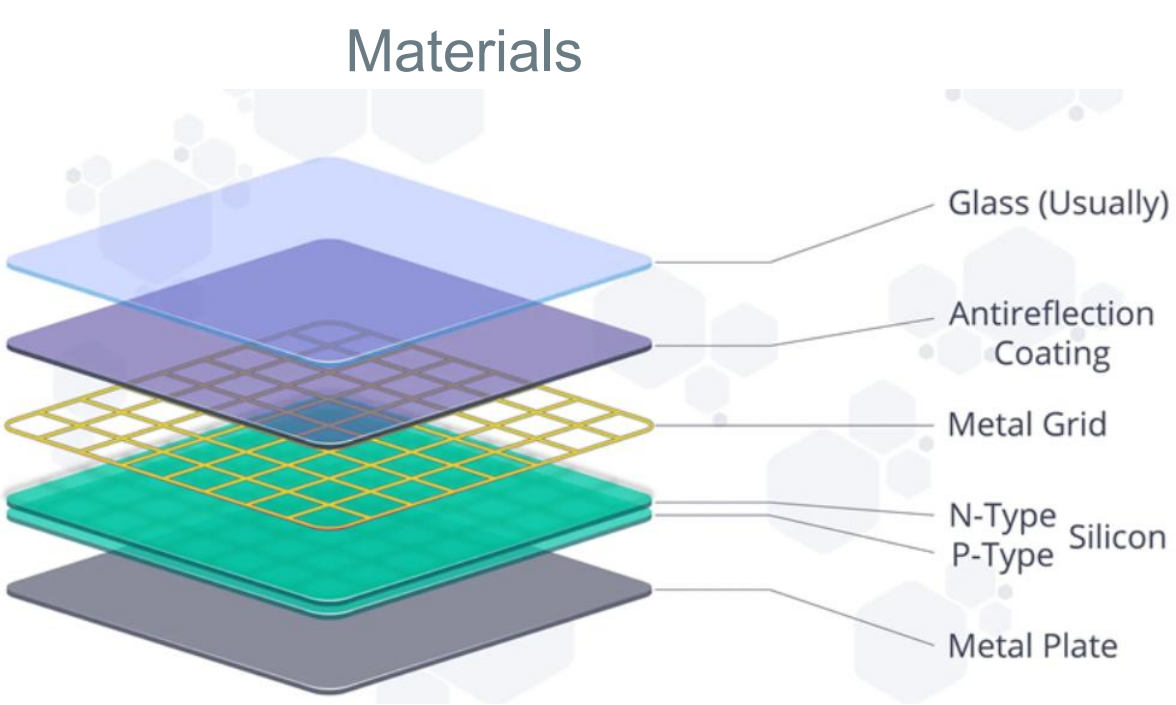
Photovoltaic (PV)

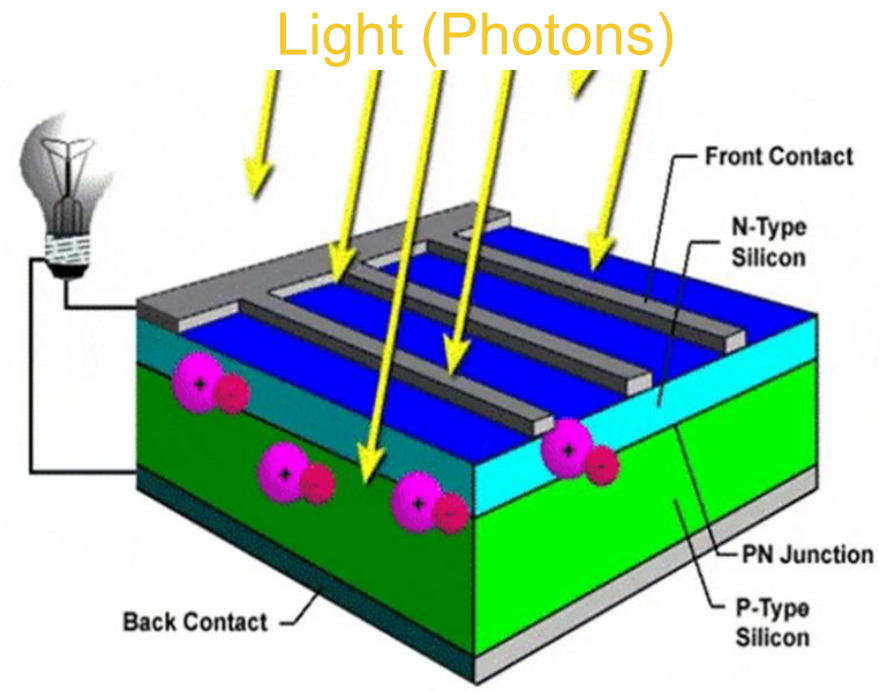
Solar Thermal

Concentrated

Solar – Photovoltaic (PV) Solar Cell

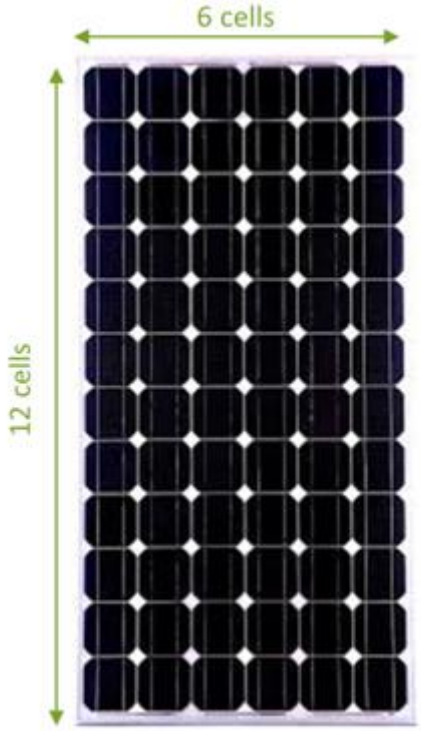
Light activates the movement of electrons between silicon layers





Solar – Terminology

one solar **Cell**



Module

(multiple cells)

Panel

(multiple modules)

Solar Array

(multiple panels)

Solar – Electrical Components

Optimizers

Grounding

Wiring

Electrical Controls

Inverter

Panel

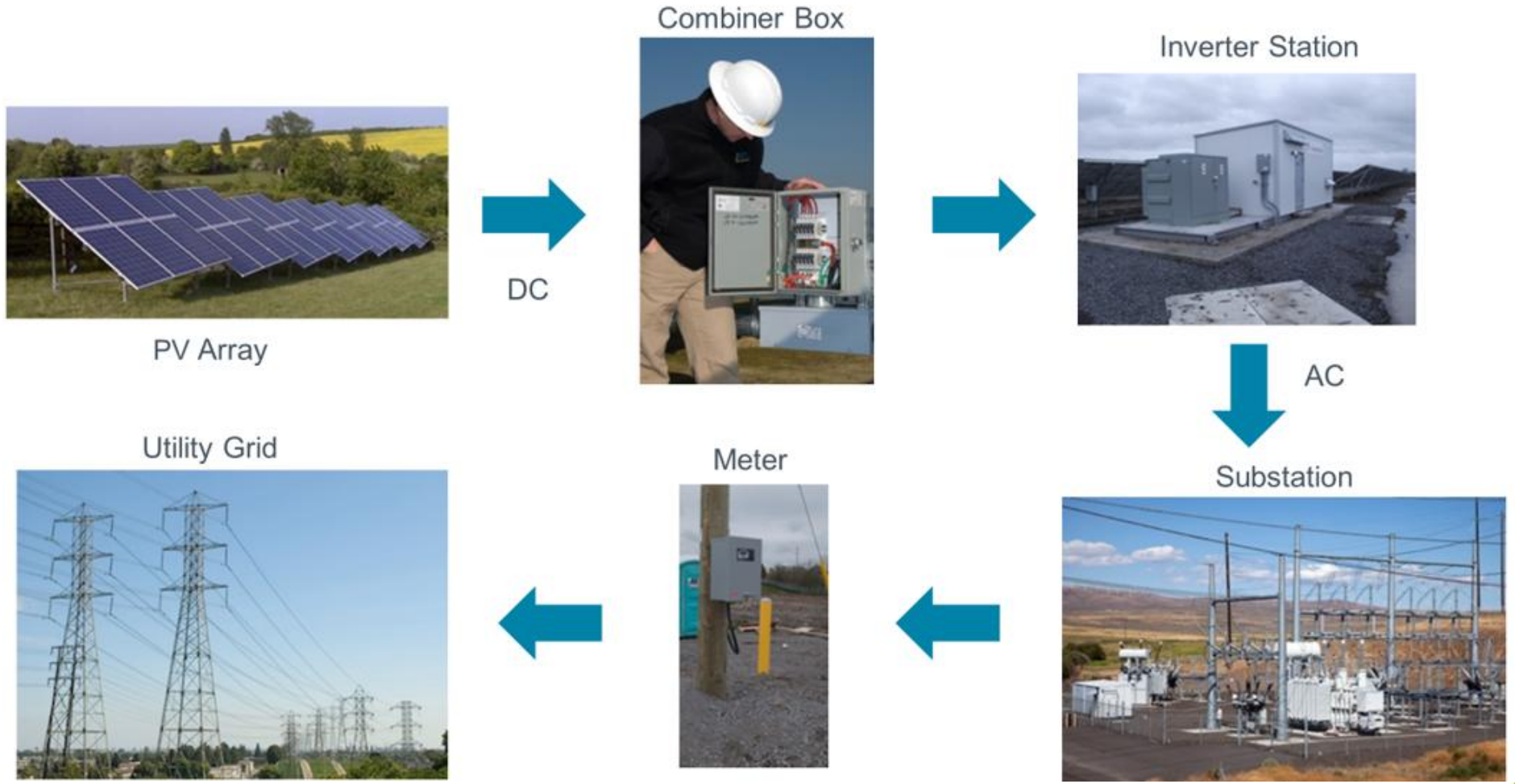
Solar – System Components

Mounting Hardware

Racking

Cable Tray

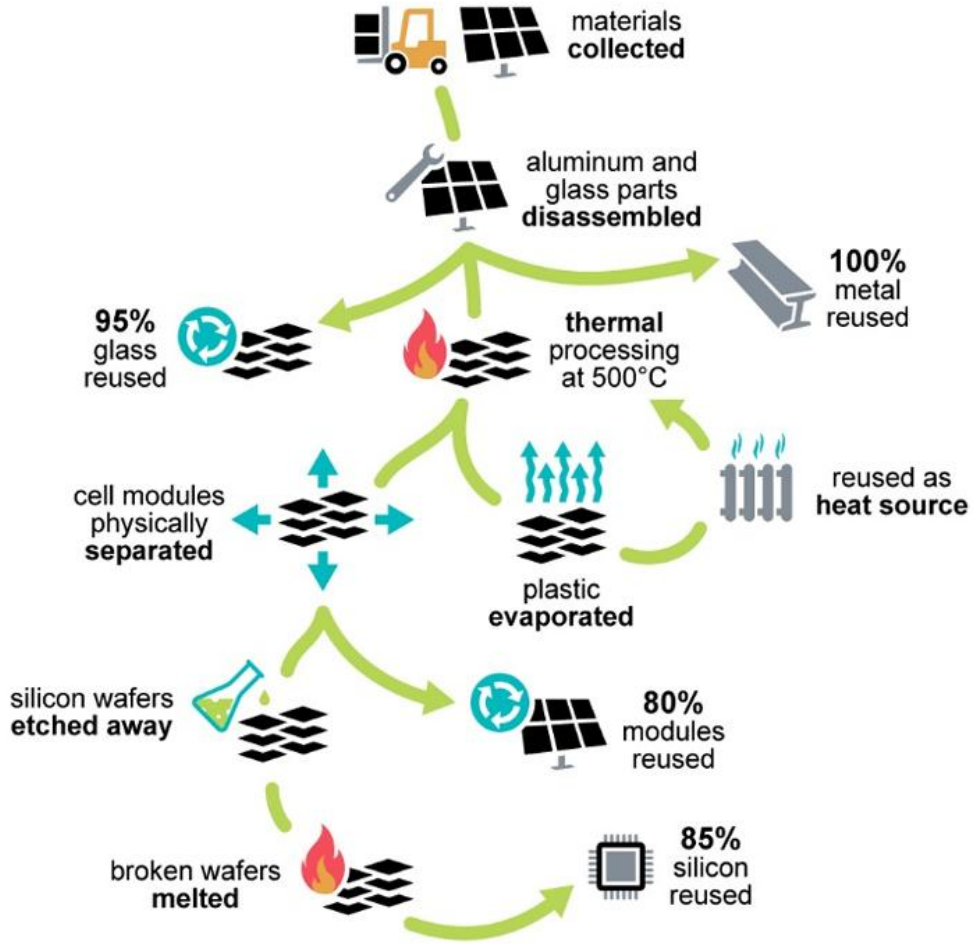
Solar – Energy Power Flow



End of Life Decommissioning and Recycling

- Solar power systems consist of recyclable materials: Copper (cabling), aluminum (racking), steel (posts), glass and electronic components.
- Solar project components can be reused, refurbished or upcycled at the end of their life, and eventually, they can be recycled.
    - Solar panels are 90% recyclable by mass

Recycling process for solar panels (silicon based)



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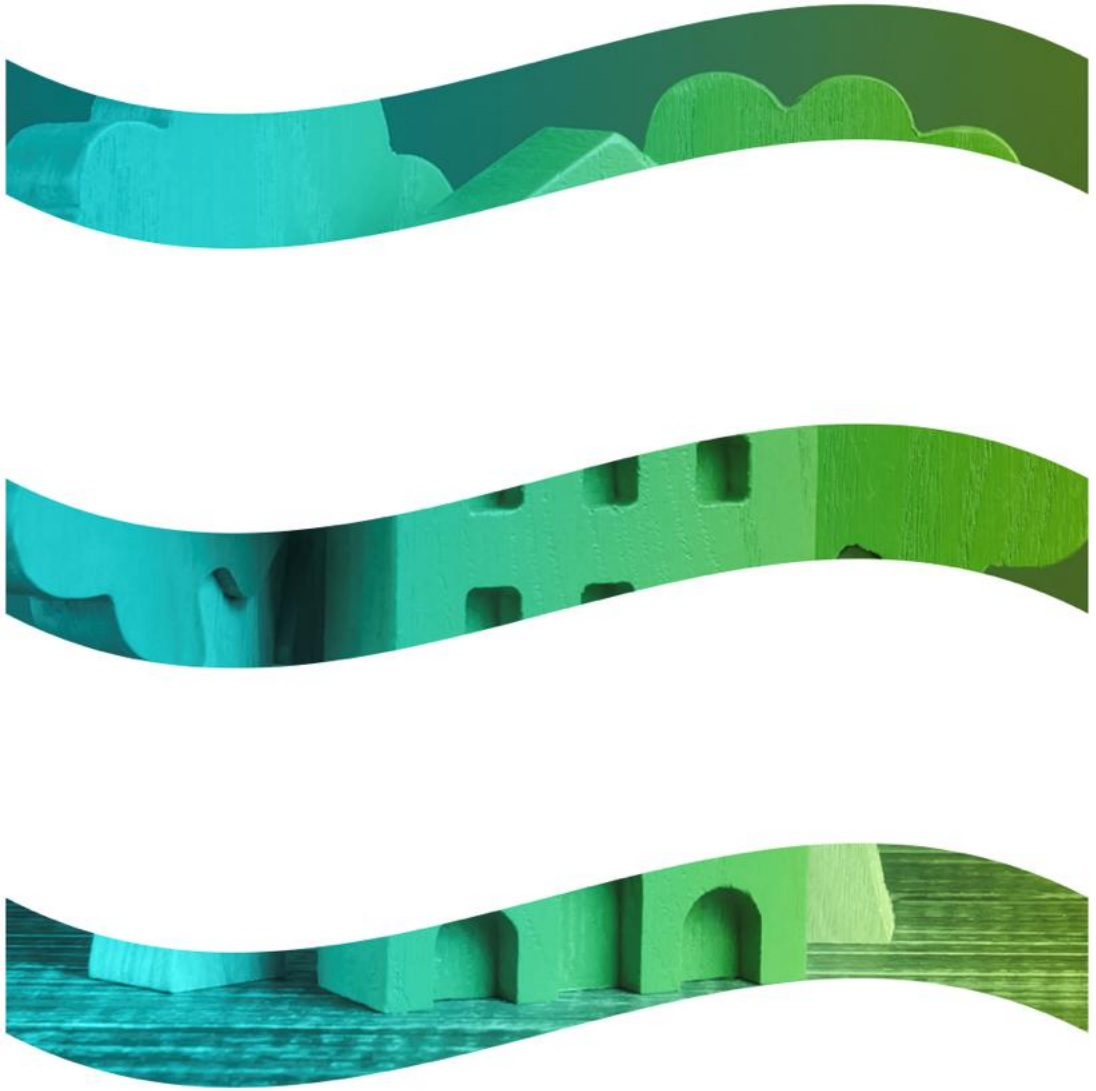
Activity 1: Solar

10:45 – 11



Small Group Activity

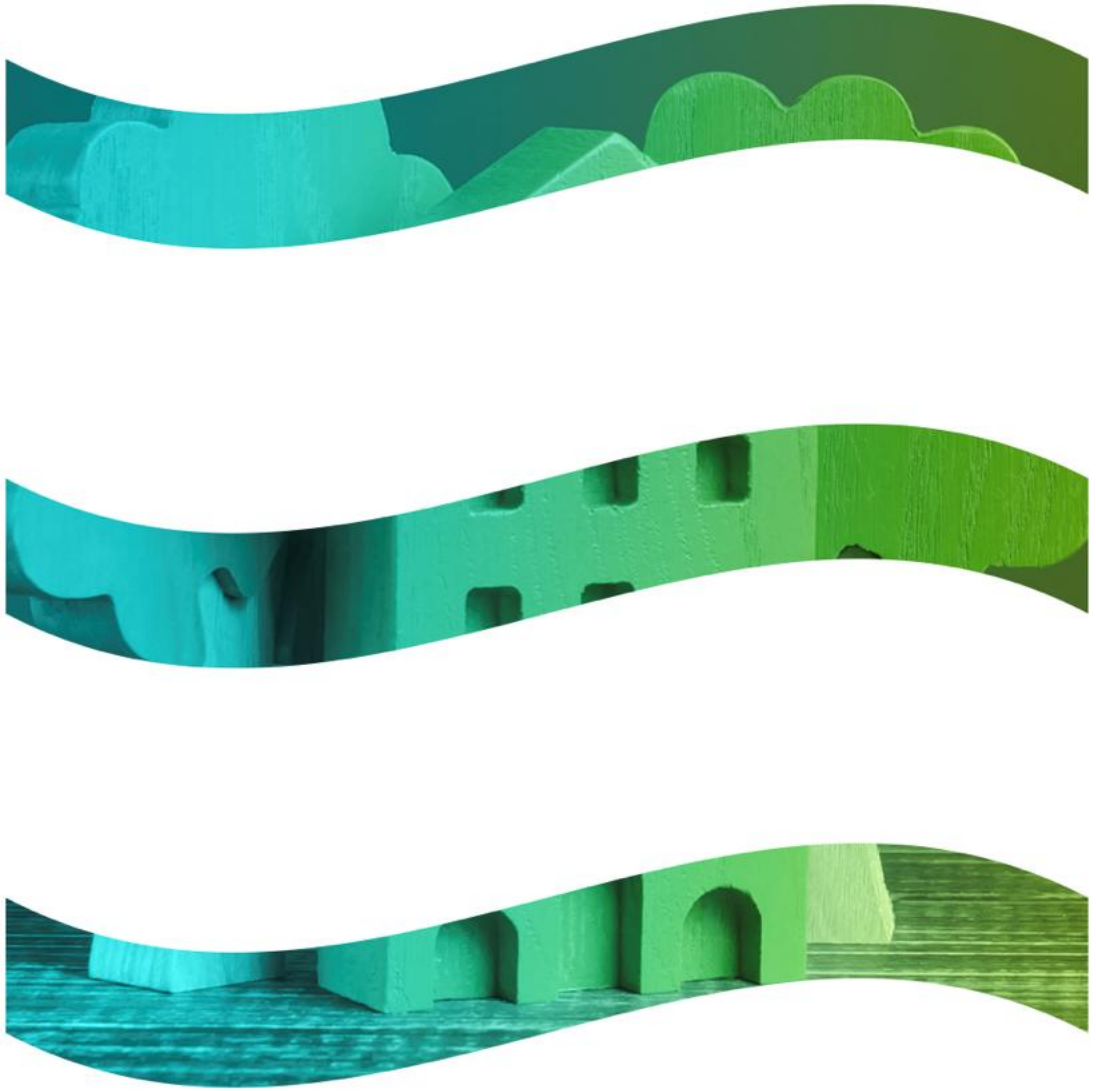
1. Do solar panels produce power without sun?
2. How does angle affect efficiency?
3. Which light color will produce the most energy?
4. What will happen to the volts when heating up a solar panel?

Report Back

- Each group share one thing that they learned, or something that surprised you

Wind Energy 101

11 – 11:15



Wind – Turbine Components

Base & Foundation

Tower

Nacelle

Rotor Hub & Blades

Wind - Foundation

- Excavation
- Concrete Base

Wind - Tower

- Tubular Steel
- Sectional
- Height varies on rotor diameter
- 90-120m height (typical)

Wind – Rotor Hub

- Holds blades
- Converts kinetic (wind) energy
- Adjusts blade pitch

Wind - Blades

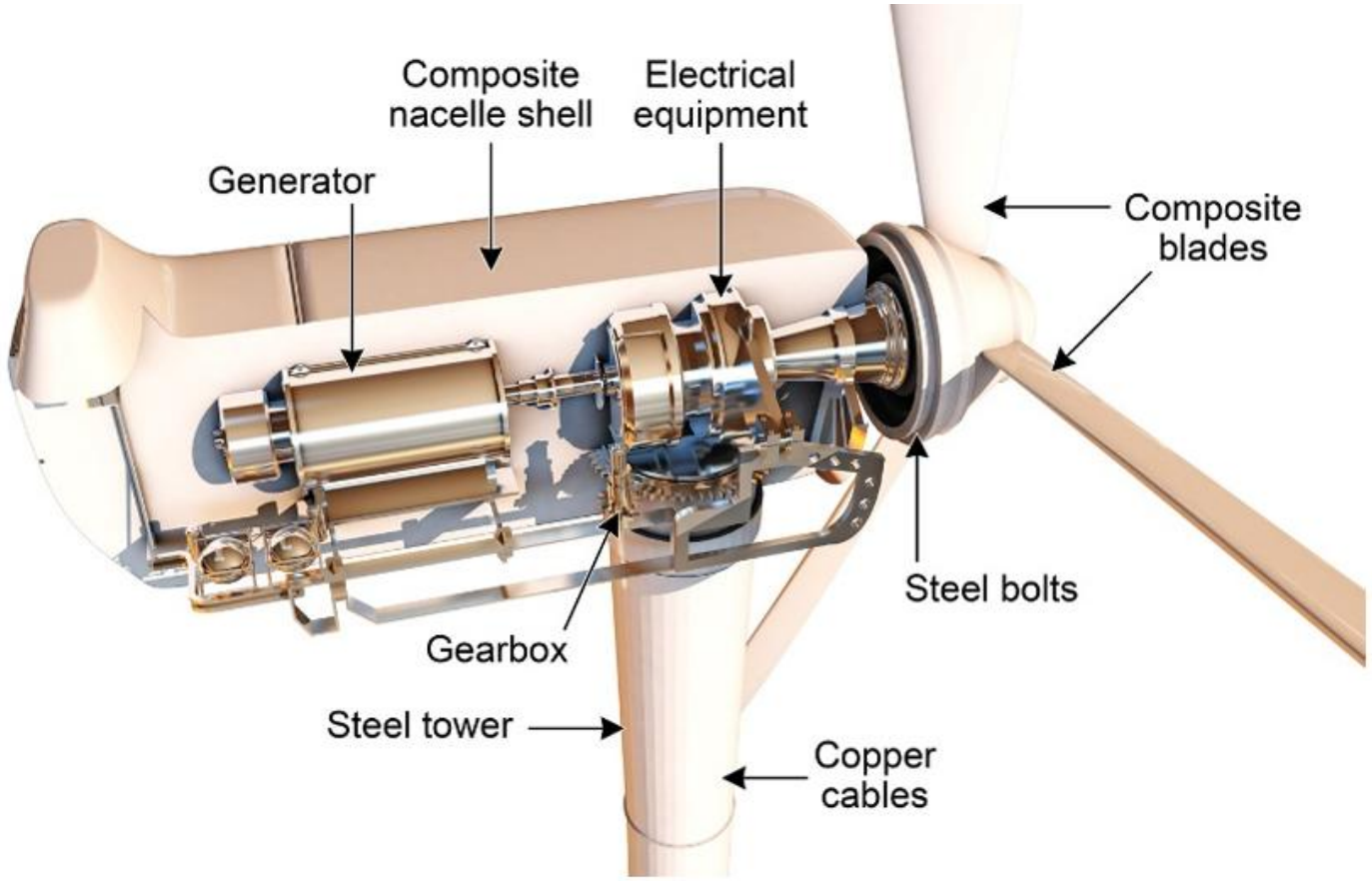
- Fiberglass and Carbon Fiber
- Balsa or Foam Core
- Reinforcing Resin
- Lightweight and durable

Wind - Nacelle

- Control Centre Housing
- Shaft & Gearbox
- Generator
- Maintenance

End of Life Decommissioning and Recycling

- Turbines are 85-90% recyclable
- Many parts retain a high value at the end of the wind turbine's life.
- Steel towers, copper cables and electrical equipment can be disassembled and recycled.
- Turbine blades made of composite materials are harder to recycle, but more options are being developed (e.g., filler in construction materials)



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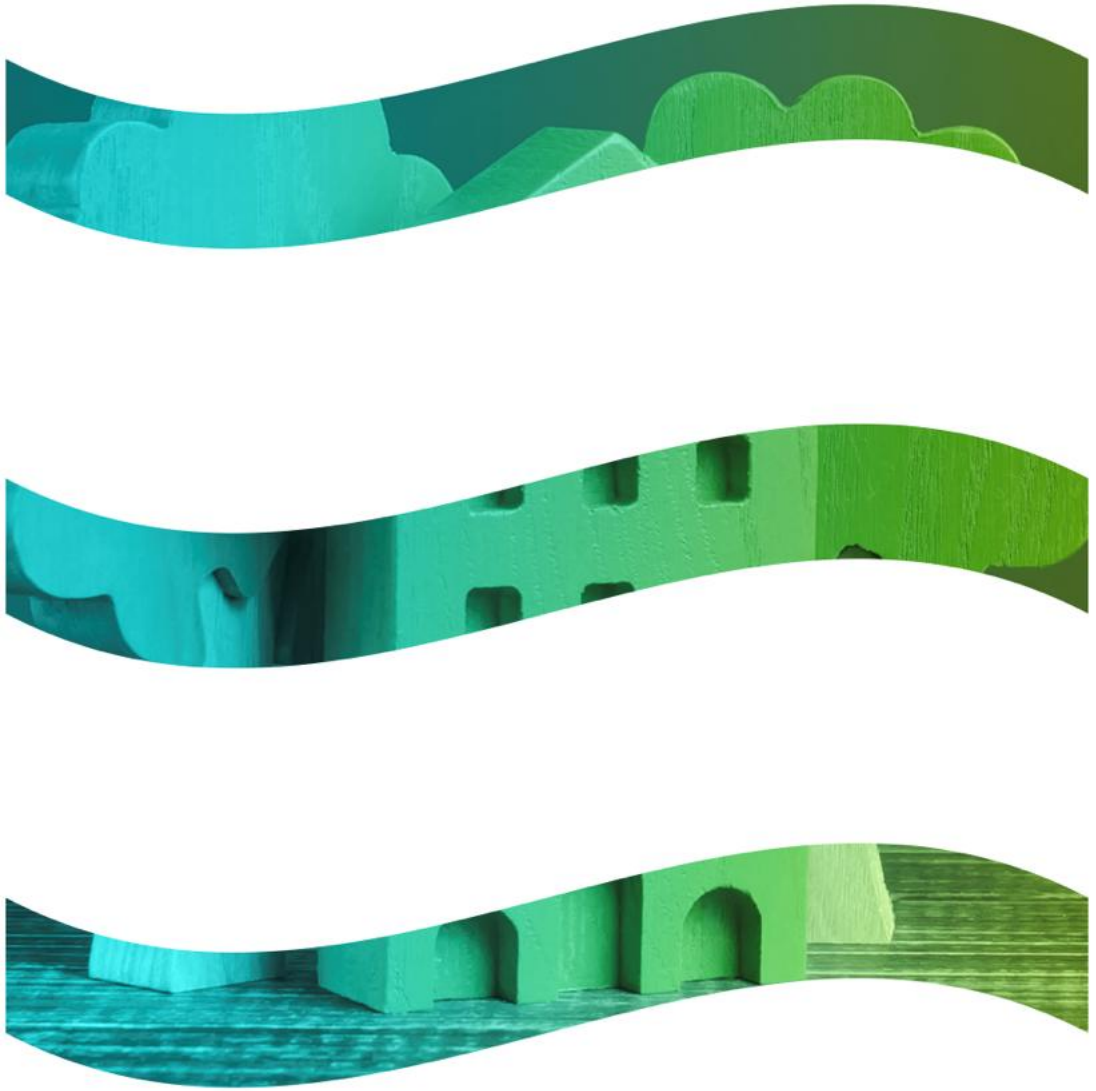
Activity 2: Wind

11:15 – 11:30



Small Group Activity

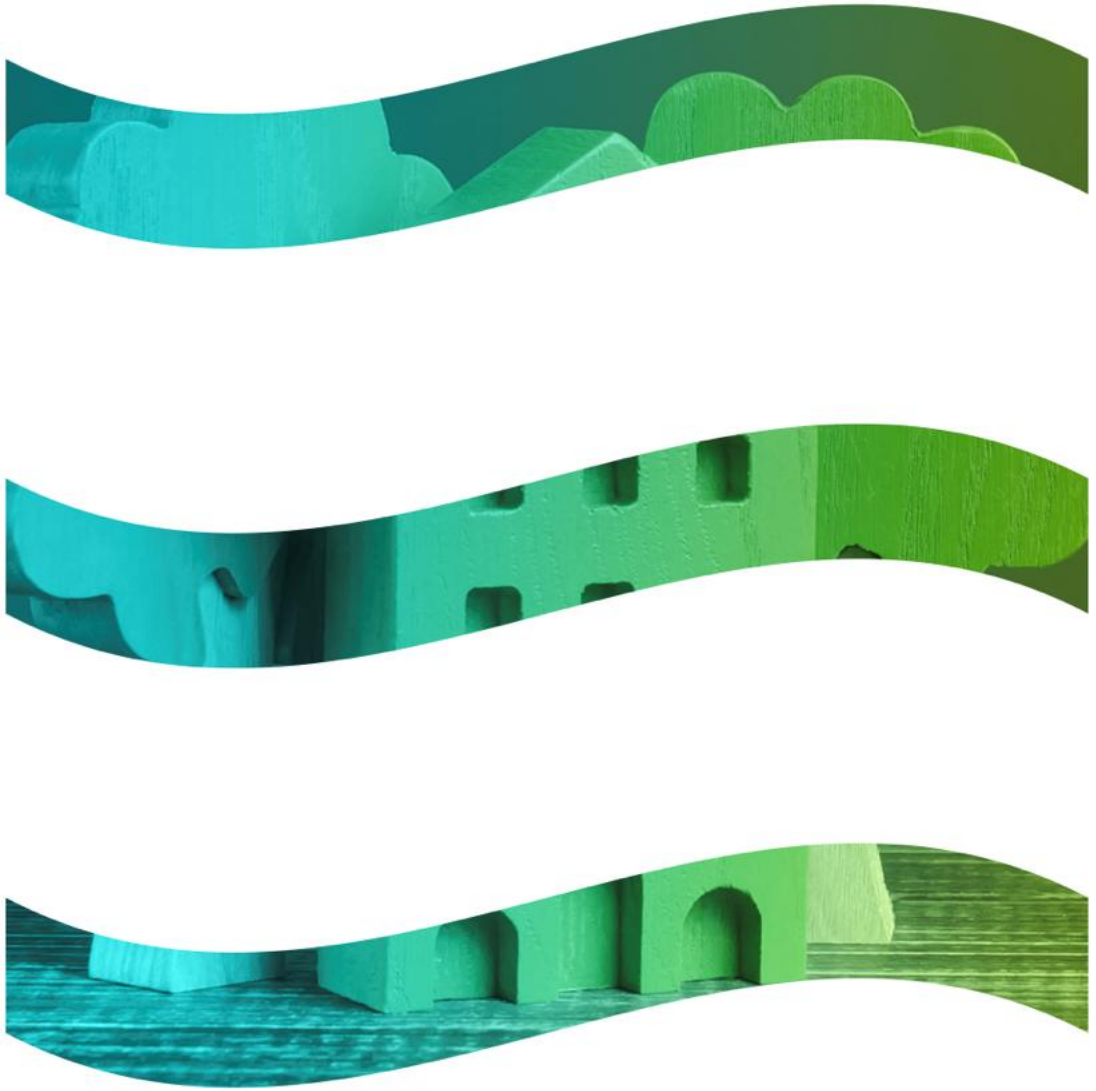
1. How many blades do you think will produce the most electricity?
    - 2, 3 or 4?
2. What size of blade do you think will produce the most electricity?
    - Small, Medium or Large?
3. What is the most amount of electricity your group can produce?
    - Competition time!

Report Back

- Each group share how much power you managed to produce and what approach they used

Activity 3: Myth Busting Quiz

11:30 – 11:45



Thank you!

If you want to learn more, or if you'd like someone to come and speak with your community about wind and solar power, let us know via **info@windandsolarbc.ca**.

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