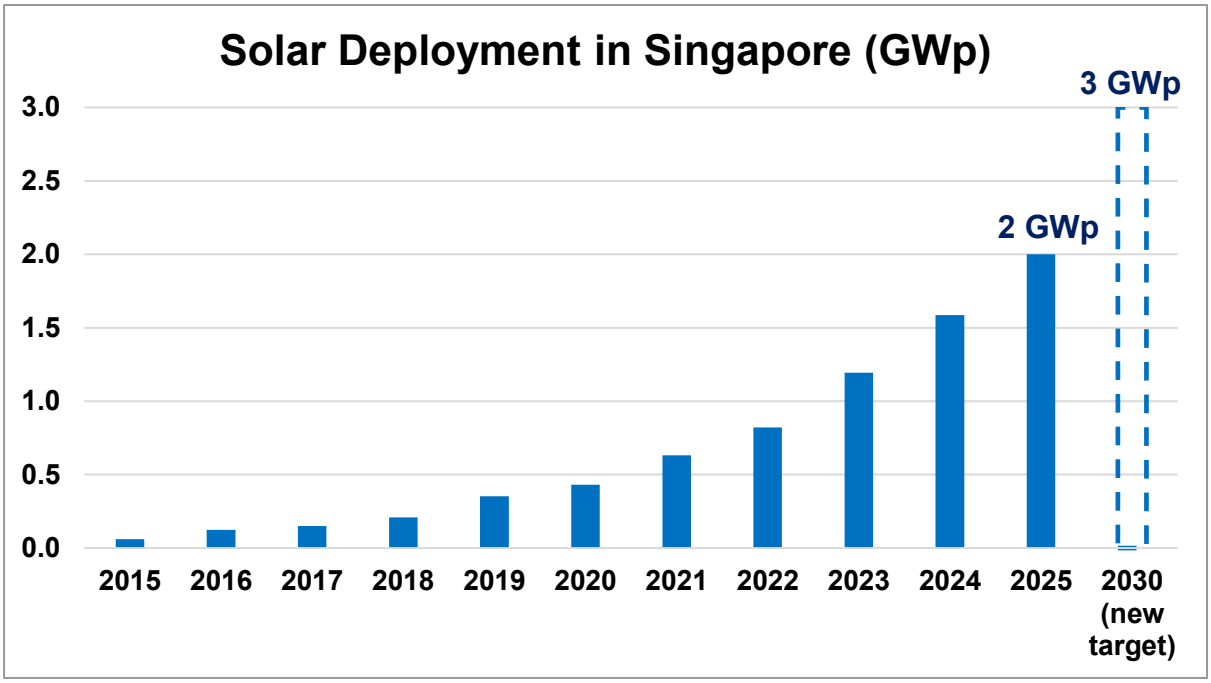
Annex A: Information on Solar Energy

Solar is the most viable renewable energy source for electricity generation for Singapore today. It contributes towards lowering our national carbon emissions, and helps enhance Singapore's energy security as a domestic source.

Referring to the chart below, solar deployment has increased steadily over the past years to reach the target of 2 GWp in 2025.



Solar Information for Consumers

1. Benefits of installing solar

   Contribute to lowering emissions. Solar is a renewable energy source that does not emit any greenhouse gas.

   Achieve cost savings. Consumers can expect to save costs on electricity as solar is generally cheaper than grid electricity. Solar can be used to offset their electricity consumption, and the excess solar-generated electricity can be sold to the grid for income.

2. Costs of installing solar

   The costs of installing a solar PV system depends on the size of the system and how the system is deployed (e.g. on rooftop or integrated into the building façade).

Consumers can recover their upfront installation costs over the system's lifespan through the electricity generated, or payback period.

a) Upfront Costs
- The upfront cost for a rooftop PV system can range from S$1,000 per kilowatt peak (kWp) for a 1,000 kWp industrial rooftop PV system, to up to S$1,600 per kWp for a smaller 10 kWp residential rooftop PV system.

b) Recurring Costs
- The annual operation and maintenance costs for residential rooftop PV systems typically form around 1-2% of the system's cost.
- It is generally recommended that maintenance works for solar PV systems are carried out every six to twelve months.

c) Payback Period
- The payback period varies depending on factors such as size of the system, electricity usage patterns and overall electricity consumption.
- For residential solar installations, the average payback period is about five to seven years. Consumers with higher electricity consumption levels and larger solar PV systems may see shorter payback periods.

3. <u>Deployment models</u>

There are typically five main deployment models for solar installations.

a) Direct Ownership
- Consumers own the solar PV installation by either paying for the full cost upfront or a fixed monthly instalment fee through a bank loan.

b) Solar Leasing
- Consumers buy solar-generated electricity from a solar company that owns the solar installation. The price that consumers pay for the solar-generated electricity will be based on the Power Purchase Agreement (PPA) between the consumer and solar company.

c) Rooftop Leasing
- Consumers rent rooftop space to a solar company, with all the solar-generated electricity being sold back to the grid.
- This is seen in the SolarRoof programme.

d) Rent-to-own model
   - Consumers rent the solar PV installation with zero upfront costs and pay a fixed monthly fee to a solar company for a period of five to ten years. The ownership of the installation is transferred to the consumer after the contract period.

e) Offsite Power Purchase Agreements (PPAs)
   - Consumers enter into a PPA with a solar company to buy the electricity produced. This involves buying electricity generated from solar PV systems located elsewhere apart from consumers' own property or facility.
   - This is most seen in utility-scale solar deployment.

4. <u>Renewable Energy Certificates</u>

Beyond electricity bill savings, solar adopters can generate additional revenue through Renewable Energy Certificates (RECs). These certificates represent the environmental benefits of clean energy generation and can be sold to businesses and organisations seeking to offset their carbon footprint, creating a new income stream for solar users. The registration of RECs can be done via solar installers or through a third-party platform.