



Canadian Renewable
Energy Association

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Clean Air Partnership: Pathways to Net-Zero Emissions in the Single-Family Residential Sector Workshop

March 10 2021

Nicholas Gall

Director, Distributed Energy Resources
Canadian Renewable Energy Association (CanREA)



The role of rooftop solar in achieving net zero



Above: A 6 kW solar home – Image: WattsUp Solar

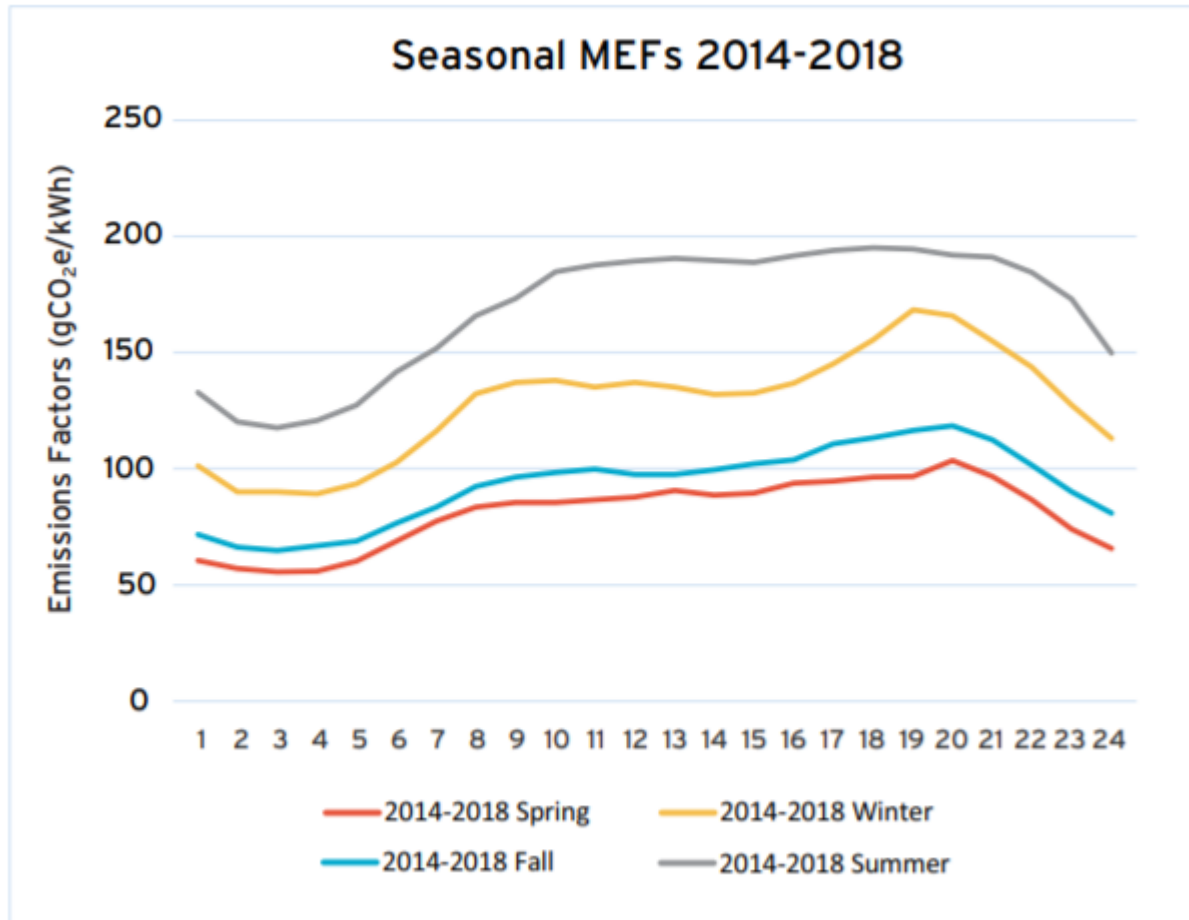
Even in the context of a “mostly clean” grid, rooftop solar can make an important contribution to net zero.

Over the course of a year, this 6-kilowatt residential PV system (left) will generate at least 7,000 kWh of electricity – Enough to power:

- An electric vehicle driving 15,000 km per year
- An electric water heater to meet a household’s annual hot water needs (average 51,100 liters)
- . . . With plenty left over for other household uses (e.g. run the dishwasher every day)

Behind-the-Meter generation and energy storage helps to avoid transmission, distribution and centralized generation infrastructure build-out, for the benefit of all ratepayers, and can be used to provide grid support services (e.g. frequency regulation)

The role of rooftop solar in achieving net zero



- Peak electricity demand in Toronto is increasingly driven by demand for space cooling – Well aligned with solar PV peak generation
- Marginal electricity generation to meet summer peaks: uneconomic and highly polluting natural gas generation
- Toronto Atmospheric Fund analysis (2019) indicates “Summer is characterized by the highest [Marginal Emissions Factor], and notable spike during the middle of the day, both associated with the higher cooling loads resulting from higher daytime temperatures in the summer”

Above: Toronto Atmospheric Fund - A Clearer View on Ontario's Emissions (2019)

Scaling up

Canada's solar industry can scale up very quickly to meet demand – Solar installers can be hired and safely trained relatively quickly; Easy transition for skilled tradespeople in other fields.

Top recommendations for getting to scale:

- **Quicker and more efficient permitting and approval process:** LDCs are extremely slow to approve connection applications for distributed generation and storage, despite significant advances in equipment safety – Each LDC has their own unique standards and practices with no coordination
- **Enable third-party ownership of net metered renewable energy generation:** Lack of access to up-front capital is a major obstacle for homeowners and businesses to invest in on-site renewable electricity, particularly for low-income households
- **Enable community net metering:** It is extremely difficult for renters, and homeowners who may lack suitable roof space, to access renewable electricity generation. Allowing off-site renewable electricity generation to be located off-site, where it can best serve the grid in terms of local congestion avoidance, can benefit both these consumers and the energy system as a whole

Contact

Nicholas Gall

Director, Distributed Energy Resources

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ngall@renewablesassociation.ca