



December 16, 2021

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Subject: Supporting Residential Roof-Top Solar and other renewable resources by clarifying eligibility of third-party leasing and financing net metering arrangements; ERO number: 019-4554

We wish to thank the Ministry of Energy, Conservation and Renewable Energy Division for the opportunity to connect on this important topic.

We are from Aecon Technical Solutions Inc. (ATSI), which is part of the larger Aecon Group. ATSI has over 20 years of experience servicing homes all across Canada, offering residential customers multitude of services. Broadly these services include, installation and repairs associated with telecom, underground and overhead cable work, smart home services and associated engineering works. Aecon has also executed many roof-top solar projects under FIT/Micro-fit programs in Ontario. We are consolidating our green energy capabilities under a newly created business vertical that will offer Green Energy Solutions to homes across Canada. Our offering includes rooftop solar, backup batteries, EV charging and energy efficiency improvement solutions as part of our smart home offering. Challenges faced on account of global warming are becoming more frequent and devastation more visible. Large proportion of general population now understand the issues and many among them want to actively participate in finding the solution; be it via EVs, rooftop solar or energy efficiency measures within their homes.

Most retail consumers of electricity are however deterred by both the technology aspect of owning and operating a relatively new tech equipment, besides the high upfront cost of such roof-top solar. Third party leasing and financing in a net metering arrangement for residential rooftops will help alleviate such concerns, while also proving cost effective in the long run. We welcome the efforts of Ministry of Energy, Conservation & Renewal Energy Division in this respect.

Type of third-party ownership structures:

Third party ownership will certainly help accelerate the adoption of rooftop solar and any behind-the-meter battery back-up that may be desirable. While new structures may evolve in future, industry already has good experience of financing arrangements that have proven successful. Some of these arrangements include:

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1. Equipment leasing, wherein users pay equated monthly charges over the tenure of the lease, which may vary from 15-20 years for the use of the leased equipment (rooftop solar plus any other behind-the-meter equipment like battery storage etc). Operation & maintenance of the equipment is mostly part of the lease arrangement and included as responsibility of the third party. Within this structure, users may opt to pay zero or some upfront cost based on which, monthly lease amount is worked out. At the end of the lease tenure, user can opt to own the equipment.
2. In some jurisdictions, users can enter into a Power Purchase Agreement with third party owner and payment is made by the user based on units (kWh) consumed from the rooftop solar.
3. Various incentives that could be available from time to time accrue to third party owner and is passed on to the users.
4. Other financing arrangements also exist wherein the users own the system and financing is made available directly to users for equipment purchase. Users can themselves arrange finance or equipment suppliers could help arrange the same.
5. Other aspects that get addressed include things like transfer of ownership of the house during the tenure of the lease, performance benchmark of equipment installed and recourse for the lessee if equipment doesn't perform as guaranteed, replacement of damaged equipment, changeover of the inverter during tenure of the agreement, remote monitoring etc.

Impact of accelerated adoption of roof-top solar

Advanced distribution networks of the future will have to accommodate many new technologies and make the system work reliably. These devices that will get added in the distribution grid will, besides rooftop solar, include back up batteries, Electrical Vehicle (EV) chargers and other distributed generation technologies like fuel cells etc. as and when these become mass consumption items in near future. As users, service providers and system operators, impact of all these new devices will need to be factored in. Most of the impact, positive or negative, has been well reported in the literature and enough experience exists on how best to address issues based on worldwide adoption of these technologies. Need-less to say, main advantages of rooftop solar is the reduction in primary generation which otherwise would come from fossil fuels, lowering of transmission and distribution losses because generation gets localized, and currents need not flow over long distances and relief from network congestion. In addition, there are grid friendly features in the power electronic devices associated with roof-top solar and battery storage that can improve performance of the grid.

On a stand-alone basis, residential rooftop solar basically amounts to dynamic variation of customer load. When solar panels are generating electricity (daytime), a fair amount of the energy is getting consumed within the household and any excess energy, which is intermittent in nature, is getting

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supplied to the grid. Load profile as seen from the sending end substation is gets modified. Within a certain level of PV penetration on a given feeder, when total PV generation (on the feeder) is much lower compared to the transformer rating of the feeder, this shouldn't pose much of a challenge. However, if the PV load on the feeder exceeds a certain level, utilities may need to look at settings of their protective relays, re-assess voltage control strategies and other technical aspects for reliable operation. These measures will be required in the medium to long term when rooftop penetration exceeds a certain level, which will be specific to distribution network under consideration, however lessons learnt from similar grids can provide guidance.

Use of battery back-up along with rooftop solar can help provide voltage and load management support.

Since EV adoption is expected to be as accelerated as PV rooftop adoption going forward, the whole debate of what impact will be felt by participating entities must include combined operation of all these power electronic enabled technologies. Tariff structures (TOU), smart control strategies deployed locally (households) & centrally (distributed load dispatch centres) will be needed for integration of these renewable assets into the system.

We look forward to continued co-operation and dialogue on the subject matter. Thank you for the opportunity to provide these comments.

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