

# A review of connection feasibility on the UQ Gatton 3.3 MW photovoltaic array

*Knowledge type: Network connections*

*Knowledge category: Technical*

*Technology: Solar photovoltaic*

## Key learning

A connection feasibility study demonstrated that connection of the proposed 3.3 MW Gatton photovoltaic (PV) array at 11 kV will not have significant technical impacts to the network, and will be significantly cheaper than connection at 33 kV.

## Implications for future projects

The Gatton project will facilitate collaboration between the University of Queensland (UQ) and Energex (the Network Service Provider) in the study of distribution network impacts from medium-scale solar PV systems. This collaboration, and the learnings from future plant operation, could serve as a model for future medium-scale projects connecting into the distribution network.

## Background

### Objectives or project requirements

UQ is constructing a 3.3 MW PV pilot research array with funding from the Education Investment Fund at its Gatton campus west of Brisbane. UQ proposed to connect this array using one of the existing 11 kV supply connections at the southern edge of the campus. Energex expressed concerns that such a connection could present challenges to other customers on this 11kV feeder and other customers supplied by Gatton zone substation generally. Energex expressed a preference for the solar plant to be connected at 33 kV. However, a 33kV connection was expected to cost significantly more, requiring costly transformers and ancillary infrastructure.

### Process undertaken

UQ commissioned a feasibility study to address the technical concerns raised by Energex. The technical concerns generally centred around the potential for impacts to the network under conditions in which the solar plant output dropped suddenly (e.g. due to a passing cloud). The feasibility study reviewed the impacts of various plant operation scenarios on transient voltage regulation, steady state voltage regulation, power factor, distribution line losses, harmonic distortions, and voltage flicker. The study found that the proposed PV system will have a small and manageable impact on the Energex 11 kV network. Furthermore, the potential for battery storage units, to be included as part of the overall EIF Gatton project, could provide further network performance improvements.