Photovoltaic inverter provides reactive power compensation

Can PV inverters be used for local reactive power compensation?
With the increasing adoption of photovoltaic systems (PVs) in distribution grid, many researchers and grid operators have proposed and started to utilise PV inverters for local reactive power compensation (RPC). The local RPC has been shown to reduce losses in the system, and to help maintain voltage within acceptable range.

Can PV inverters and passive devices decentralized reactive power compensation?
The proposed decentralized reactive power compensation by PV inverters and passive devices was able to maintain voltage deviations within allowable limits and network losses were efficiently reduced. Presented research also disregards inverter losses.

What is the cost-benefit analysis of reactive power generation by PV inverters?
In Reference , a cost-benefit analysis of reactive power generation by PV inverters is given. The PV losses are considered in detail and cost of the produced kVArh is estimated. Savings due to range of 2-8%) and for load power factor range of 0.85-0.95.

Does reactive power compensation increase the cost of a PV system?
It is important to note that the LCOE of the PV system with reactive power compensation is higher than the conventional system for every ISR condition. As expected,there is an increasein the system costs when the reactive power is provided by the PV inverter. In comparison with the reference value,this increase is 46.6% higher for ISR = 100%.

Do PV inverters have reactive power capability?
Since PV inverters have reactive power capability,they can provide immediate reactive power support to the grid for voltage regulation. Reactive power requirements for interconnection agreements are specified at the POI (Point of Inter- connection).

Is reactive power injection a viable ancillary service of a PV inverter?
Finally, the economic analysis based on LCOE showed that reactive power capability increases the system costs due to more inverter replacements. The results can serve as motivation for PV owners and power system operators to determine the viability of reactive power injection as an ancillary service of the PV inverter.

As shown in Figure 2, the reactive power compensation modes are determined by the voltage of smart inverters.The yellow circle range in Figure 2 is drawn based on the limitation of the rated current, which protects the inverter from over ...