

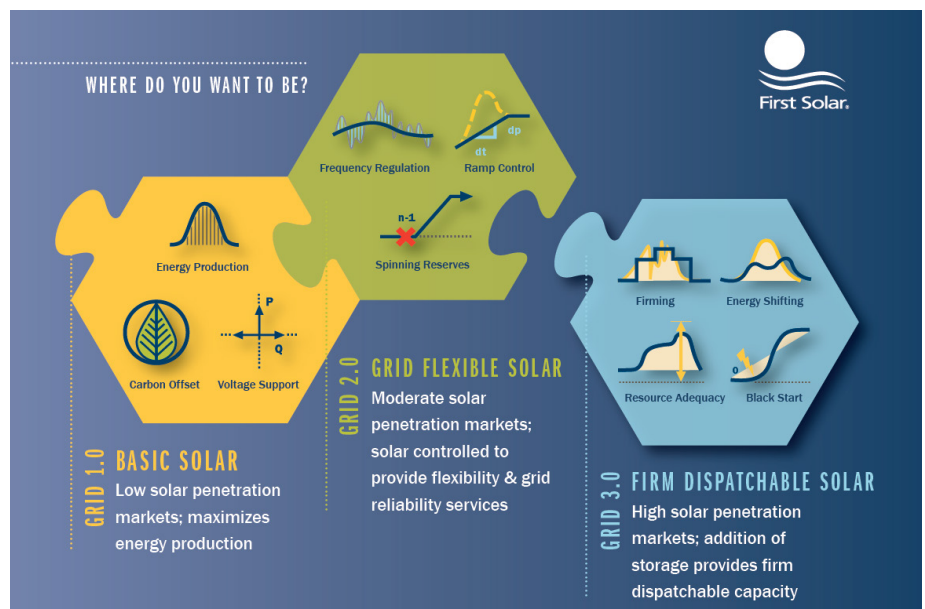
### OVERVIEW

As solar penetration increases due to rapidly declining costs, grid operators face new challenges in managing the variable nature of solar electricity to deliver safe, reliable, and affordable energy. During low load periods in spring and fall, there is often more midday solar electricity produced than the grid can incorporate. In the evening when the sun sets and solar production decreases as demand increases, conventional fossil fuel generation rapidly ramps to maintain grid balance between supply and demand.

### ENHANCING THE GRID

Through smart controls, including curtailment targeted to provide reserves, solar can be used to create cost-effective flexible capacity that supports supply and demand balancing. This creates tangible value for the grid. This added flexibility allows large-scale solar to provide grid reliability services such as frequency regulation that out-perform conventional generation sources. Such capabilities enable operators to more effectively manage resources to maintain grid balance during daytime and early evening transitions. With the addition of storage, solar can even provide firm capacity that can be dispatched as needed – just like a conventional generation plant.

First Solar is uniquely positioned to lead the evolution of grid solutions through advancement of technology and championing market and policy reforms that will make it possible to use solar electricity whenever and however it is needed. With this evolution, solar will become a mainstream generation source.



### ENABLING GREATER SOLAR PENETRATION

Solar is now the most cost-effective new generation resource, and further solar penetration will be enabled as system operators understand how to leverage solar to address and solve real and perceived grid-related constraints. Solutions include:

- **Solar generation that supports grid reliability**, like conventional plants, by providing NERC-recommended features such as ramping capability, voltage support, fault ride-through and much more
- **Solar generation that provides essential grid services** such as frequency regulation that allow system operators to respond quickly and strategically to changing conditions
- **Alignment of procurement rules and contracts** with grid flexibility and reliability goals
- **Cost-effective, right-sized storage solutions** that provide customers with dispatchable product during the critical early evening period