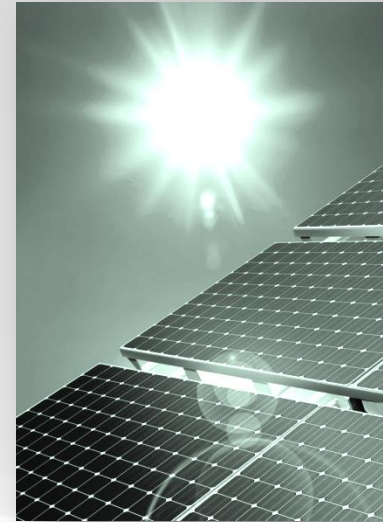


NYISO Solar Forecasting Activities



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New York Solar Summit 2015

*June 10, 2015
New York, NY*

Roles of the NYISO



Reliable operation of the bulk electricity grid

- *Managing the flow of power over 11,000 circuit-miles of transmission lines from more than 300 generating units*



Administration of open and competitive wholesale electricity markets

- *Bringing together buyers and sellers of energy and related products and services*



Planning for New York's energy future

- *Assessing needs over a 10-year horizon and evaluating projects proposed to meet those needs*



Advancing the technological infrastructure of the electric system

- *Developing and deploying information technology and tools to make the grid smarter*

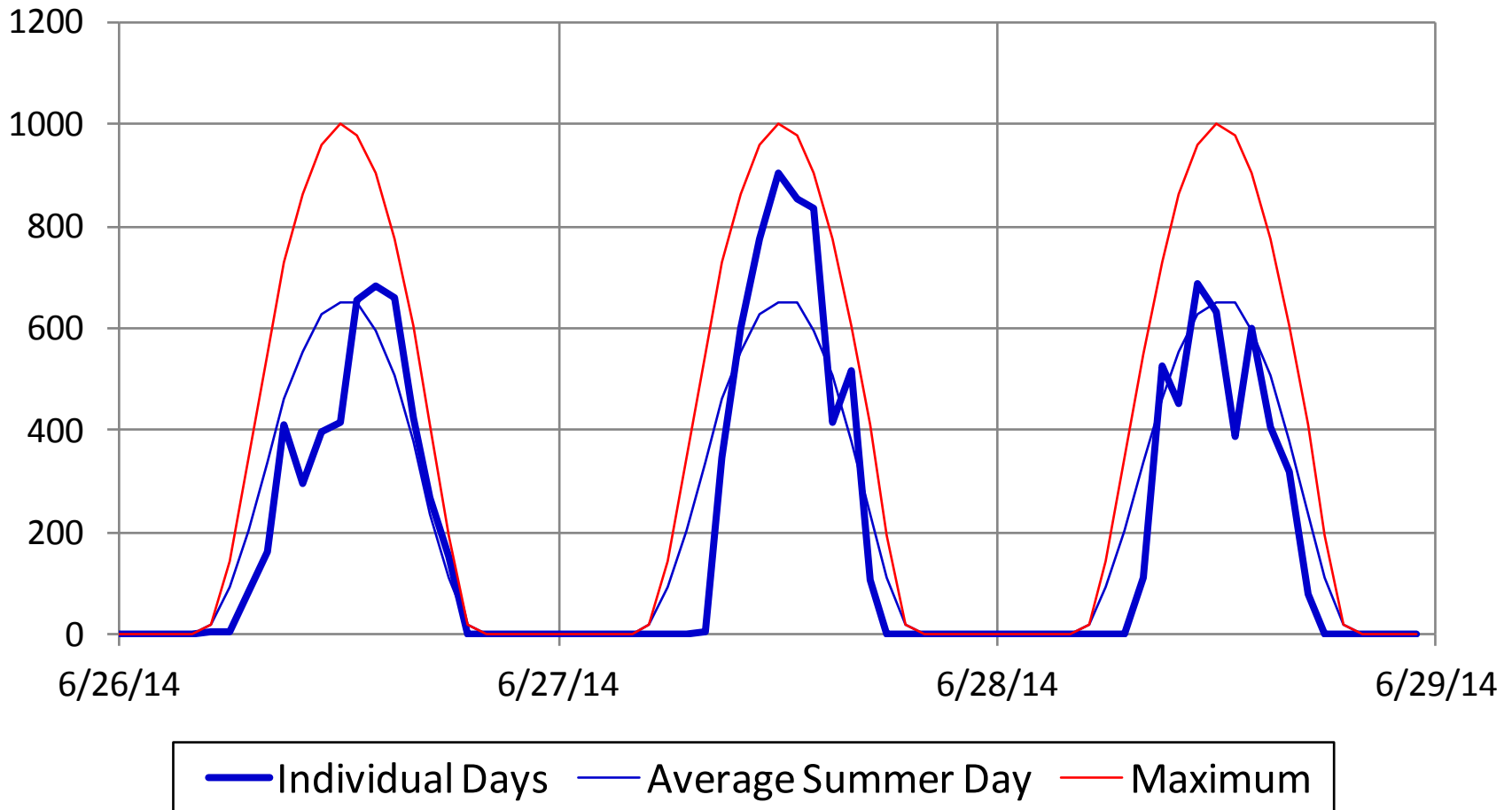
Current Outlook for Solar Power in New York

- ◆ 309 MW-DC of installed solar PV capacity by the end of 2014
 - *Additional 63 MW-DC added through April 2015*
- ◆ NY-Sun Initiative expects to achieve 3,000 MW-DC of behind-the-meter installed solar PV capacity by the year 2023
- ◆ The NYISO's 2015 Gold Book forecast is for the solar PV to have a peak load impact of 760 MW by 2023
 - *Solar peak is from 12 noon to 1 pm in June*
 - *Impact at 4 pm to 5 pm at system peak, typically in July, will be less*

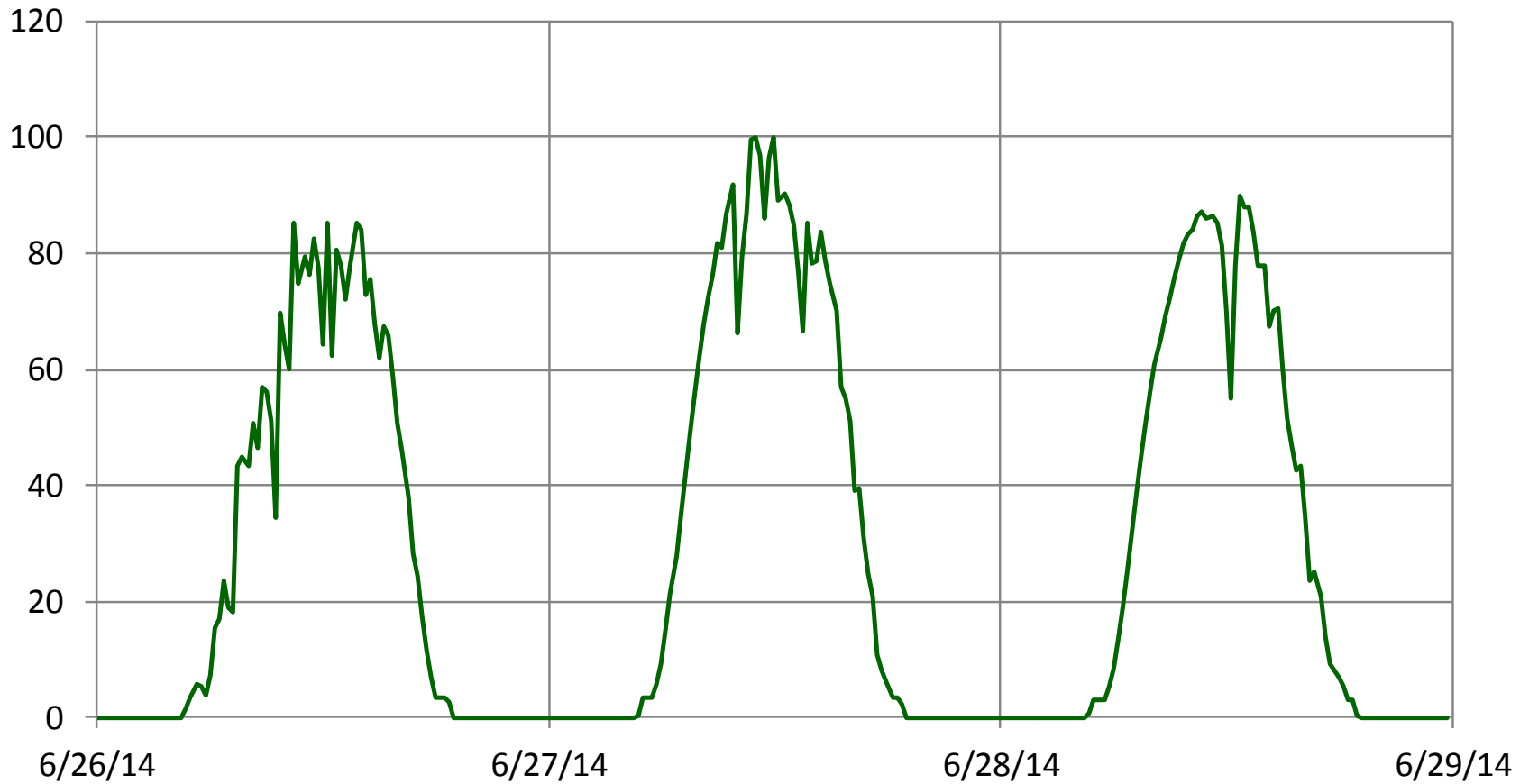
Impacts of Solar PV on New York Electric Grid

- ◆ Offsets other types of generation
- ◆ Reduces carbon dioxide and other emissions (*as compared to equivalent fossil-fueled generation*)
- ◆ Increases the variability of load in real time (*due to intermittent nature of solar resource*)

Actual Hourly Irradiance Can Be Very Intermittent.... (Watts per m²)



.... With a Corresponding Variability in Solar PV Output Per-Unit AC Power at 15-minute Intervals



NYISO Solar Integration Study

- ◆ **Develop new solar forecasting tools & methods**
- ◆ **Research the experiences of other independent system operators in addressing solar PV integration**
- ◆ **Evaluate solar generation variability and its impact on customer load**
- ◆ **Review operational impacts of various levels of solar and wind resources**

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.

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