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For Immediate Release:
July 5, 2016

NYISO Issues *Power Trends 2016*
Report Surveys the Changing Energy Landscape

Rensselaer, N.Y. — The New York Independent System Operator (NYISO) today released its annual *Power Trends* report, which provides an in-depth look at the forces shaping the future of the New York State electric grid.

The 2016 report examines shifting patterns of electricity use, a growing need for investment in transmission infrastructure, persistently low natural gas prices, and public policies promoting renewable and distributed resources. These dynamics are all combining to reshape the energy landscape, the report finds.

"How people think about and use electricity is changing as quickly as the technology that generates and delivers it," said Brad Jones, NYISO President & CEO. "Our grid operations and electricity markets are transforming to serve consumer needs, address public policy goals, and meet rigorous requirements for electric system reliability."

The annual *Power Trends* report also serves to promote awareness and understanding of the key forces and factors facing New York's energy future. Among the major conclusions for this year, the report highlights:

- ***Changing Energy Usage and Moderating Peak Demand***
    - Year-over-year growth in the **overall usage** of electric energy from New York's bulk electric system is expected to **flatten or decline slightly** over the next decade.
    - **Peak demand**, the period of electric usage, is projected to grow, but it is expected to increase at a more **moderate pace** than previously forecast.
    - **Energy efficiency** is expected to **reduce peak demand** on New York's bulk power system by 255 megawatts in 2016 and by more than 1,800 megawatts in 2026. Distributed solar photovoltaic resources and other behind-the-meter resources are also reducing demand from the bulk electric system as consumers install on-site systems to meet their electricity needs.
- ***Transmission as Enabler***
    - **Upgraded transmission** capability is vital to efficiently moving power to address regional power needs. The **downstate** region of New York (Long Island, New York City, and the Lower Hudson Valley) annually **uses 58 percent** of the state's electric energy. Yet, that region's power plants **generate only 40 percent** of the state's electricity.
    - New York's major **hydropower** resources and all existing and proposed **windpower** projects are **located in northern and western regions of the state** – hundreds of miles from the high-demand metropolitan regions of southeastern New York. Expanded transmission will more effectively deliver renewable power throughout the state.

- ***Enhancing Environmental Quality and Cultivating Green Power***
    - From 2000 through 2015 **New York's air quality improved** as **power plant emission rates dropped** significantly. **SO_2** emissions rates declined **97 percent**. **NO_x** emission rates declined **79 percent**. CO_2 emission rates declined **42 percent**.
    - In 2015, **23 percent** of New York's electricity was produced by **renewable** resources. Electricity produced from water, wind, solar and other renewable sources accounted for 32,943 gigawatt-hours of the 142,346 gigawatt-hours of electric energy generated in New York last year.
    - The generating capacity of **wind-powered projects in New York grew** from 48 megawatts in 2005 to **1,754 megawatts in 2016**. More than **3,700 megawatts** of additional windpower projects are **currently proposed** for interconnection with the New York bulk electric system.
    - There is currently one grid-scale solar project in New York, a 32-megawatt facility located on Long Island. Another **233 megawatts** of generating capacity from grid-scale solar photovoltaic projects are **currently proposed** for interconnection with the New York bulk electric system.
    - New York's proposed **Clean Energy Standard** will mandate that 50 percent of all electricity consumed in New York by 2030 come from clean and renewable energy sources. The NYISO estimates that the additional renewable energy would require carbon-free generating capacity additions approximately equivalent to the following levels, which reflect the limited ability of intermittent resources to generate electric energy compared to their maximum installed power capacity:
        - **25,000 megawatts** of **solar** photovoltaics, or
        - **15,000 megawatts** of **wind** turbines, or
        - **4,000 megawatts** of **hydro** power.
- ***The Impacts of Natural Gas and the Future of Nuclear Power***
    - Power plants fueled by **natural gas** (both gas-only & dual-fuel) provide **57 percent** of New York's total generating capacity.
    - **47 percent** of New York's generating capacity is composed of **dual-fuel** units. These facilities, predominantly located in downstate New York, offer the flexibility of operating on natural gas or an alternative fuel (typically oil), as determined by market signals or reliability requirements.
    - Natural gas and dual-fuel projects account for more than **70 percent** of the proposed generating capacity being studied by the NYISO for interconnection to the grid.
    - Low natural gas prices drove **record low wholesale electric energy costs** in 2015. The average wholesale electric energy price ($44.09 per megawatt-hour) was the lowest in the 15-year history of New York's competitive markets for wholesale electricity.

- The effects of persistently low natural gas prices on wholesale electricity prices may be positive for consumers in the near-term, but it is contributing to emerging resource adequacy issues as power plants retire and the fuel mix becomes less diverse. From 2016 to 2018, **approximately 2,300 megawatts of generation are planned to retire or suspend operation**.
- The **emission-free attributes of nuclear generation** and the fast-starting ability of gas-fired turbines to balance variable resources such as wind and solar mean that both types of generation provide essential support for New York's clean energy goals.

- ***Integrating Distributed Energy Resources***
  - New York' State's **Reforming the Energy Vision (REV)** initiative is identifying regulatory changes and market developments to facilitate the role of distributed energy resources.
  - **Distribution-level solar photovoltaics**, in 2016, have an estimated summer capability of more than **250 megawatts**. That total is **expected to triple by 2026**.
  - Recently adopted changes **open NYISO markets to behind-the-meter generation** that produces more power than consumed by its host facility. This is expected to **introduce more than 100 megawatts** of existing capacity into New York's wholesale electricity markets.
  - In collaboration with its stakeholders, the NYISO is developing a **Distributed Energy Resource Roadmap** to help guide changes in wholesale electricity market design that will enhance integration of distributed energy resources. In addition, the NYISO is developing **forecasting tools needed to successfully integrate solar resources** and exploring the potential of storage resources with an **Energy Storage Market Integration and Optimization** initiative.

- ***Markets Sustaining Reliability and Enhancing Efficiency***
  - New York's **competitive wholesale electric markets have provided significant benefits** to the State and its electricity consumers. Since 2000, the markets have contributed to **improved generation efficiency and lower reserve requirements** that produced **$7.7 billion in savings**; **reduced carbon emissions** equivalent to taking approximately 5 million cars off the road, and **increased renewable generation** that provides enough wind-powered electricity to serve half-a-million New York homes**.**
  - **New generation** -- representing **30 percent of the current capacity** of New York's power plants – has been added since the start of New York's wholesale electricity market. From 2000 to 2016, those additions totaled more than **11,600 megawatts.**
  - More than **80 percent of the new generation has been added in the Hudson Valley, New York City and Long Island**, where demand for power is greatest.
  - Since 2000, **more than 2,700 megawatts of transmission capability have been added** to serve the high-demand southeastern New York region.
  - **Demand response** programs developed in competitive wholesale markets provide more than **1,200 megawatts** of resources to address peak demand.

- **Markets have consistently responded to reliability needs** in New York. The NYISO has conducted seven reliability assessments since it launched its comprehensive reliability planning process in 2005. Five assessments identified emerging reliability needs. In each case, markets responded to address those needs, avoiding the need to call upon regulatory solutions.
- **Broader Regional Markets** initiatives involving the Northeast, Mid-Atlantic, and Midwest, and the Canadian provinces of Québec and Ontario are **reducing the need to use more expensive local power when less costly power is available from a neighboring grid operator.** They also have shortened the time commitment for moving power across control area borders, which allows **faster responses to changing conditions**.

For more information, please see the *Power Trends 2016: The Changing Energy Landscape*, which is available on the NYISO website, www.nyiso.com.

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