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## Siemens and Mortenson complete Bipole III HVDC Converter Stations in Canada

- **Bipole III is a 2,000 MW HVDC project enabling transmission of renewable energy via almost 1,400 kilometers**
- **Close collaboration enabled on time delivery of a highly complex project in a challenging environment**
- **The project significantly strengthens the reliability of Manitoba's electricity supply**

The consortium of Siemens and Mortenson has successfully completed the  $\pm$  500-kilovolt (kV) Bipole III high-voltage direct-current (HVDC) power converter stations for customer Manitoba Hydro. The HVDC converter stations are an integral part of the Manitoba Hydro Bipole III transmission project. The entire transmission line will act as an "electricity highway", bolstering the reliability of Manitoba's electricity supply by reducing dependence on existing HVDC transmission lines, while also ensuring low-loss transport of renewable hydropower from northern generating stations to meet growing energy requirements. HVDC converter stations are specialized substations that support the conversion of electric power from high-voltage alternating-current (HVAC) to high-voltage direct-current (HVDC), or vice versa, a critical component to interconnecting separate power systems.

The Bipole III converter stations include the Keewatinohk Converter Station in northern Manitoba near Hudson Bay, and the Riel Converter Station near Winnipeg

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in the southern region of the province. The converter stations have a transmission capacity of 2,000 megawatts (MW) – enough to meet over 40 percent of the province’s peak electricity demand. HVDC transmission is the ideal technology to implement when electricity must be transported over vast distances from remote areas where it is produced to urban and industrial centers where it is needed, as HVDC transmission suffers much lower electricity losses than standard AC transmission.

“Our proven HVDC technology will enable Manitoba Hydro to integrate and deliver clean renewable energy while enhancing grid reliability and enabling power sharing,” said Mirko Düsel, CEO Transmission Solutions at Siemens Energy Management. “After commissioning, Bipole III will deliver renewable energy to southern Manitoba and the United States, helping to reduce reliance on fossil fuels.”

The Siemens and Mortenson consortium was responsible for the turnkey supply of the HVDC converter equipment and associated facilities, with Siemens delivering the system design and the manufacturing, supply and commissioning of the core HVDC technology while Mortenson provided design support and construction services for the supporting infrastructure, including converter station building, AC filters, and DC switchyards. “Siemens is a global leader in HVDC technology as Mortenson is in construction. With this combination of expertise and a joint effort within our organizations and Manitoba Hydro, we were able to complete this critical and challenging project on time and on budget,” said Faisal Kazi, President and CEO, Siemens Canada. The remote location of the Keewatinohk Converter Station, and the extreme winter weather conditions present at both sites provided interesting logistics and construction challenges for the team.

“The successful delivery of Bipole III required synergy between our customer Manitoba Hydro and the consortium of Siemens and Mortenson, a mutual respect

for each other's expertise and a laser focus on the project goals and deliverables," said Mark Donahue, Vice President and General Manager at Mortenson. "The project management and construction experience we amassed through our years as a General Contractor and an EPC partner were fundamental to the project's success."

Siemens is a global leader in HVDC technology and has commissioned more than 50 HVDC systems worldwide since the 1960s and conducted continuous research into the further development of the technology. In 2010 Siemens implemented the first project in the world using multilevel technology. This extremely network-friendly and compact technology features additional closed-loop and open-loop control functions of the kind familiar from power plants. Siemens recently launched which allows operation with overhead power lines as well as underground cable connections and allows to clarify 98 percent of all faults without interrupting operation. In Europe alone, Siemens is currently implementing seven HVDC projects. Another six HVDC links and four offshore grid connections using Siemens direct-current technology are already connected to the grid – combined these projects have a transmission capacity of more than 8,000 MW. That is eight times as much as a reactor block in a nuclear power plant generates on average.

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