Xtreme Power

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11-IEP-1G
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California Energy Commission
1516 Ninth Street
Sacramento, California 95814

VIA Email: docket@energy.state.ca.us

Re: Docket No. 11-IEP-1E, 11-IEP-1G "Transmission Planning for Renewables" Comments on Integrated Energy Policy Report Committee Workshop on Transmission Needed to Meet State Renewable Policy Mandates and Goals

Commissioners and Staff of the California Energy Commission,

These comments address Docket No. 11-IEP-1E, 11-IEP-1G and "Transmission Planning for Renewables." Over the course of the past year, the CEC has heard about Storage in various dockets and workshops. In the present docket, the subject is Transmission Planning. These comments seek to illustrate and clarify the potential for Storage for Transmission.

Background

In fulfilling the Energy Commission's legislative mandate to adopt a strategic plan for the state's electric transmission grid, the Commission staff has conducted a workshop on May 17. The Commission invited comments on recommend actions required to implement Transmission investments necessary to ensure reliability, relieve congestion, and meet future load growth in load and generation, including, but not limited to, renewable resources, energy efficiency, and other demand reduction measures. Xtreme Power, Inc. is a manufacturer of megawatt-scale Dynamic Power Resources™ that combine energy storage, bi-directional four-quadrant inverters and control systems to allow instantaneous response with real power and reactive power to meet grid needs.

XP successfully implemented and commissioned multiple commercial demonstrations, often but not exclusively integrated with intermittent renewable generation. DPRs™ consist of safe and efficient PowerCells™ combined with high performance power electronics and a configurable control system, with each component sized to address each customer's individual power and energy needs. XP integrates all key components into a large-scale, utility-ready system that operates with a customer's existing or planned infrastructure.

Storage for California Transmission
California utilities have demonstrated energy storage at the megawatt-scale, designed and sited for Transmission-related functions. Southern California Edison (SCE) installed a 10 MW battery energy storage system (BESS) at its Chino substation facility in 1988. Later, SCE installed an energy source power system stabilizer to test the concept of providing damping of power system swings using the BESS.

Currently, SCE is engaged in the development of the Tehachapi Wind Energy Storage Project with CEC support. Descriptions of this project mention many benefits, including the integration of renewables, reduced congestion and reduced losses. There are also several Transmission benefits. Presentations made by SCE mention voltage support, and grid stability.

Transmission investments necessary to ensure reliability and delivery of remote resources
The expansions of Transmission, especially the large-multi-state projects that terminate in California, will require network upgrades to accommodate the new transfers reliably. The Commission is right to inquire into "challenges to interconnecting renewables to the transmission system; and observations and recommended actions to ensure timely transmission system upgrades" as it did with the May 17 workshop. There is always a risk that remote generation will have challenges getting adequate capacity for interconnection and that Transmission upgrades may be delayed.

A fraction of the necessary Transmission investments, especially the system upgrades that integrate the new capacity transfers, are needed to ensure post-contingency stability and grid reliability. In the usual practice, meeting those needs would require additional transmission upgrades in order to maintain system reliability. The recommendation here is to encourage the use of Storage as a means to upgrade the Transmission system.

How Storage can upgrade Transmission
The past examples of the Chino BESS and the Tehachapi Wind Energy Storage Project illustrate the approach of using the flexibility of siting battery-based Storage combined with the very fast response capabilities of these technologies to provide post-contingency stability to the grid. In simple terms, this approach relies on the strategically sited Storage to dynamically respond to system conditions when there is a disturbance. Under normal conditions, the Storage is not required to discharge, even at peak loads.

The sequence of events in this approach is to study the benefits of the Storage as a source of real and reactive power at key locations. Storage systems should be included as possible upgrades when power flows are modeled at higher levels or new Transmission terminating in the State is proposed. Assuming the Storage has been built for the studies, the Storage would respond to a contingency on the Transmission system, such as the loss of a line, and carry some amount of load after the contingency.

This may be very fast and very briefly, or depending on the nature of the contingency and the system configuration, the duration of the discharge from the Storage may be longer. By absorbing some or all of the contingency, the power flows can be increased pre-contingency without risking the reliability of the system. A simple set of drawings is attached to illustrate this approach with conceptual levels of existing transmission and increased power flow. In the illustration, instead of the existing lines being limited to 100 MW capacity each because of the need to carry 200 MW post-contingency, the Storage will carry 50 MW post-contingency. Thus, the carrying capacity of each line can be raised so that the flow after the loss of a line still does not exceed the 200 MW limit.

In light of the needs for more Transmission, and the enactment of AB 2514, the potential to meet some of the State's need for network upgrades through Storage is an opportunity that the Commission should explore. We recognize there is a great deal of work to be done. If Storage can provide a new approach that makes some of the upgrades possible on a timely, cost-effective basis, then the Transmission needed to meet the State's goals will be available for the benefits of all.

Respectfully submitted,

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Xtreme Power Inc.

Enclosures: Power Point Slides, pages (5)

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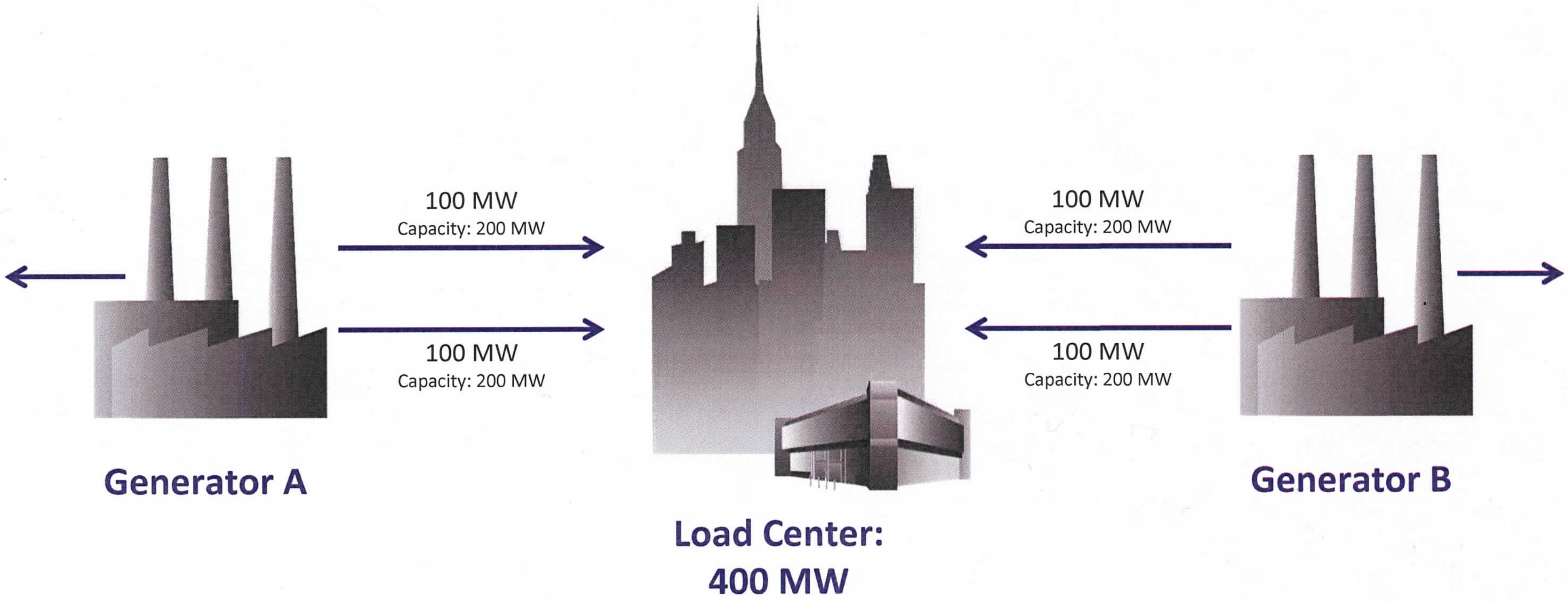
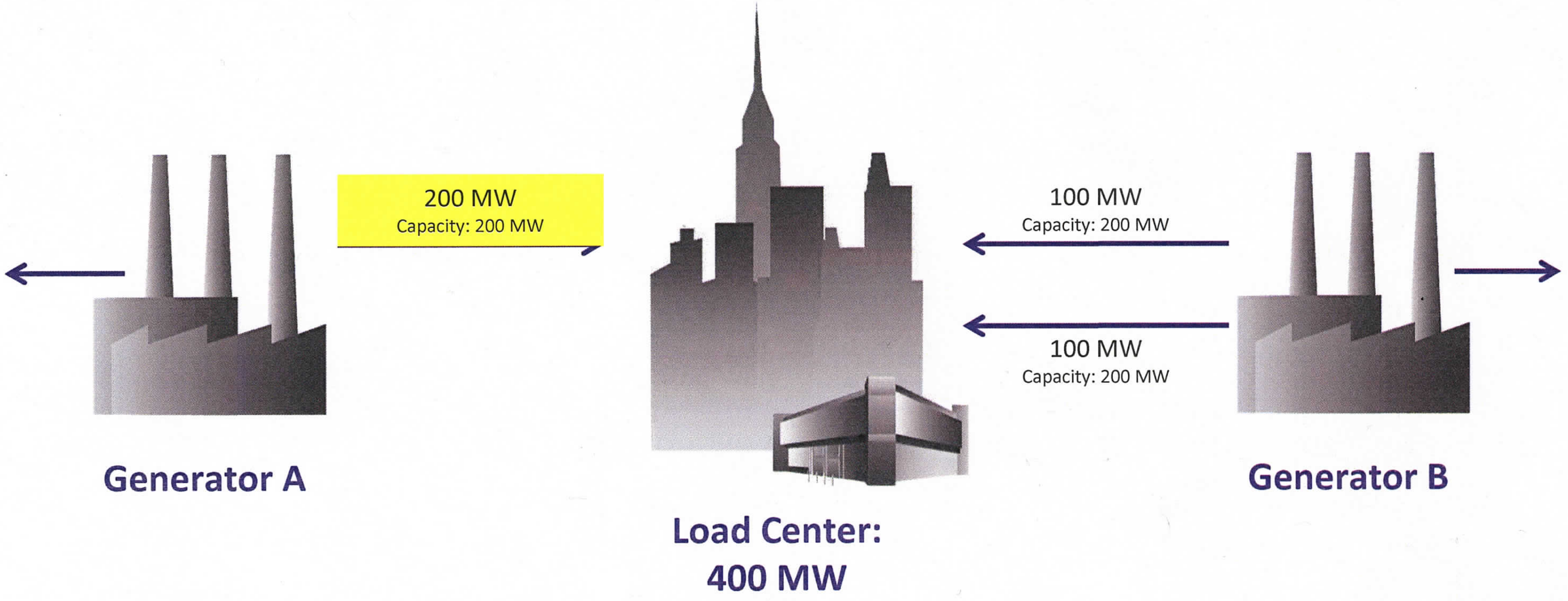
T&D in networks



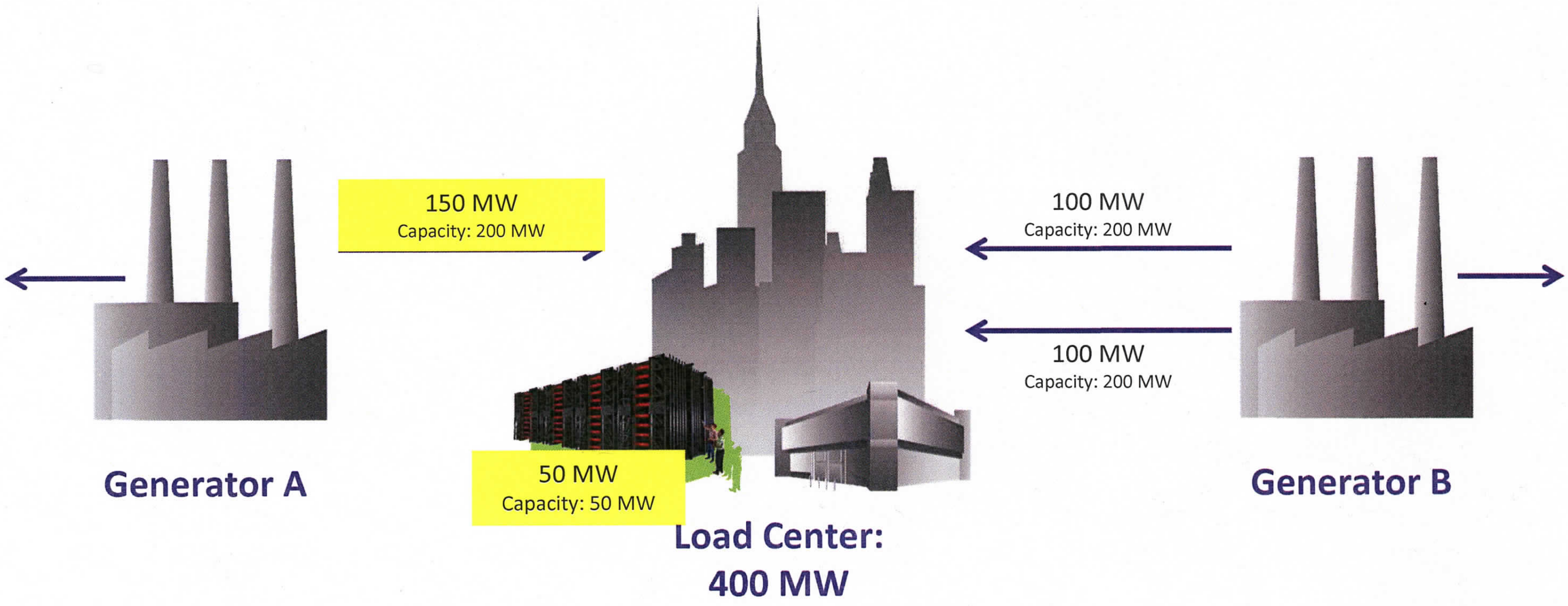
Business As Usual

N-1 Capability



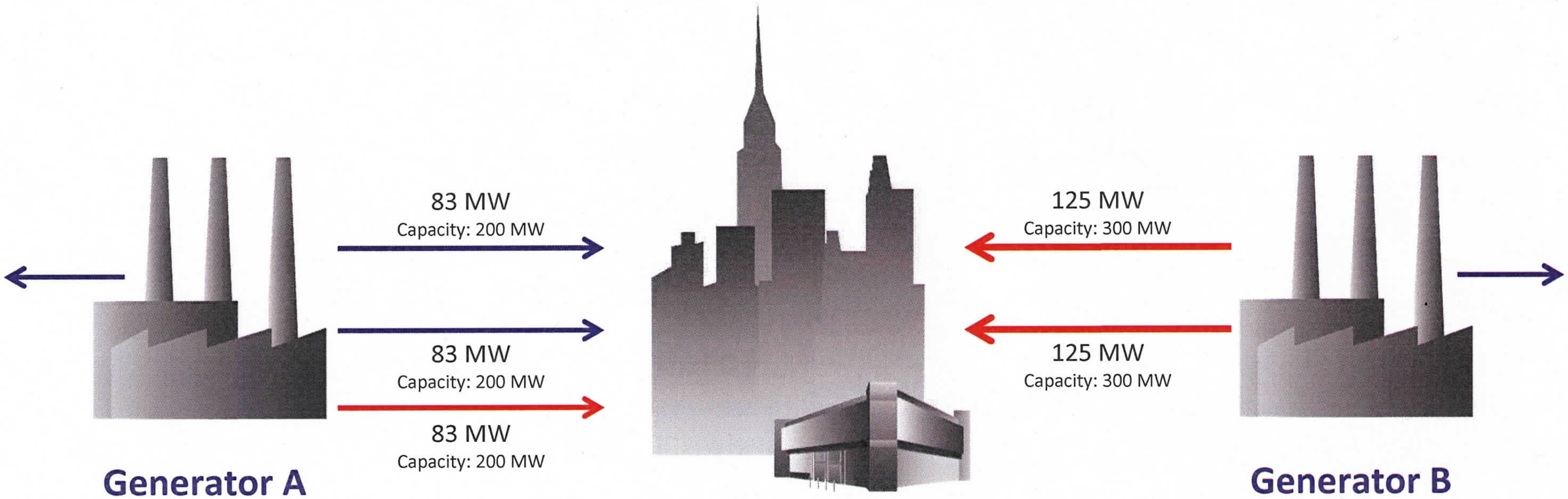
With one transmission line interrupted, second line serves load.

Loss of Line: Storage Engages



The supply flowing on interrupted transmission or distribution line now comes from storage. Storage runs until system stabilizes.

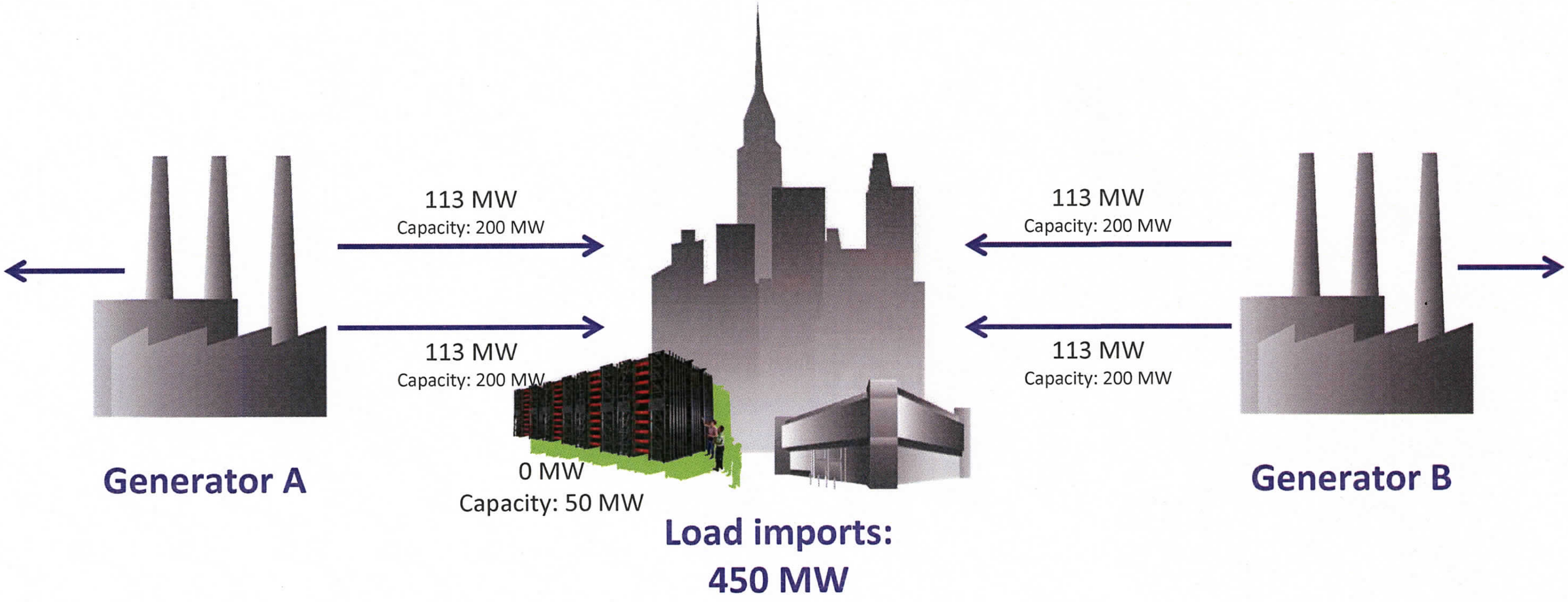
Usual upgrades



Add remote wind: import 450 MW

Transfer grows by 50 MW. Traditional solution is to either add another line (shown on left) or increase current line capacity with lumpy additions (shown on right, red lines). Expensive and long installation time.

Storage Defers Upgrades



Clean, less-expensive, perfectly sized energy storage is placed in urban setting within months to meet load growth and N-1 requirement. This defers traditional upgrades, offers a fast solution and saves rate-payers money.