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KEMA Collaborates on Large-Scale Offshore Energy Storage System *Innovative “Energy Island” Key Technology for a Sustainable Energy Future*

BURLINGTON, MASS., (September 13, 2007) – KEMA, in partnership with civil engineering firm Bureau Lievense and technology illustrators Rudolph and Robert Das, has developed an “Energy Island” concept to store power generated from an offshore wind farm. The innovative concept design is the initial result of an on-going feasibility study being conducted for Dutch energy companies.

The Energy Island designed by KEMA, Lievense and the Das brothers incorporates a new concept in pumped hydro storage – an inverse offshore pump accumulation station (IOPAC). On the Energy Island when there is a surplus of wind energy, the excess energy is used to pump sea water out of the interior ‘subsurface-lake’ into the surrounding sea. When there is a shortage of wind power, sea water is allowed to flow back into the interior ‘lake’ through commercially available generators to produce energy. The IOPAC is unique from conventional pumped hydro storage systems in that it would be stationed on an artificial island off the Dutch coast in the North Sea and comprised of a ring of dikes surrounding a 50 meter deep reservoir. The island itself would be built from materials dredged to deepen the interior reservoir.

KEMA analysis estimates that the proposed Energy Island storage system would have a maximum generation capacity of 1,500 MW, depending on the water level. It also would have an annual storage capacity of more than 20 GWh – enough energy to offset 500 to 840 kilotons of CO₂ emissions. In the next phase of the feasibility study underway KEMA is further analyzing the costs and benefits of additional regulating reserve, download wind power, CO₂ reduction, and environmental impact.

Utilizing stored energy can help reduce the overall amount of CO₂ emissions associated with electricity production, especially when combined with wind or other renewable energy resources. Investment in large scale energy storage can increase the efficiency of conventional power plants as well as offset investments in replacing or developing new conventional peak production capacity. In addition to providing an alternative for large scale electricity storage, the energy island concept has the potential to provide coastal protection, harbor and/or LNG terminal facilities, aquatic biomass, and eco-tourism opportunities. Construction of the energy island is dependent on seabed composition. The North Sea site studied includes a seabed with a thick layer of clay.

The US is actively developing advanced energy storage technologies and systems through public-private partnership programs such as the US Department of Energy (DOE) Energy Storage System Program. Technologies in development include various battery systems, advanced flywheels, superconductivity, compressed air, and pumped hydro. The Energy Island concept is an important step forward in demonstrating the role of large-scale energy storage in enhancing the reliability of the power supply, stabilizing the cost of electricity, and reducing CO₂ emissions.

KEMA will be presenting a paper on the Energy Island as well as on additional small-scale electricity storage projects at the Electrical Energy Storage Applications and Technologies conference being held September 23 - 26, 2007 in San Francisco, California. Additional information on the Energy Island, including the report executive summary with renderings, is available at http://www.kema.com/press_releases.

About KEMA

KEMA (www.kema.com) is a global provider of business and technical consulting, operational support, measurement and inspection, testing and certification for the energy and utility industry. KEMA clients include energy and utility companies, investors, government agencies, and major industrial electricity consumers as well as energy and utility sector suppliers, electrical component and end-product manufacturers, and retail and wholesale energy traders. KEMA employs 1,500 professionals in 20 countries. KEMA's North American consulting operations are headquartered in Burlington, Massachusetts. Parent company N.V. KEMA is headquartered in Arnhem, the Netherlands with subsidiaries and offices worldwide.

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Artist renderings of the inverse offshore pump accumulation station:

