

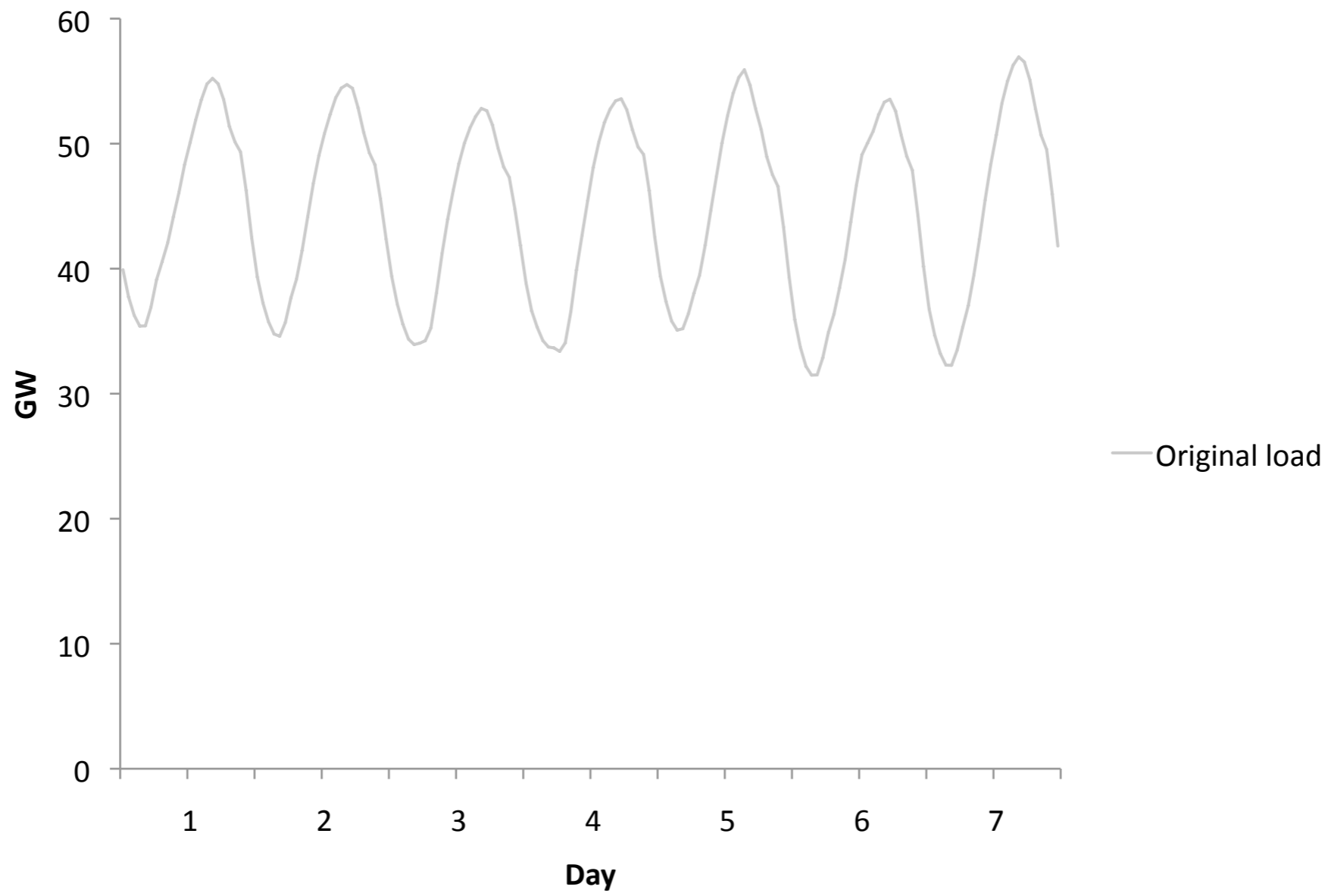
Brief remarks to Panel 2D
Power Grid Integration

Expert Group Meeting

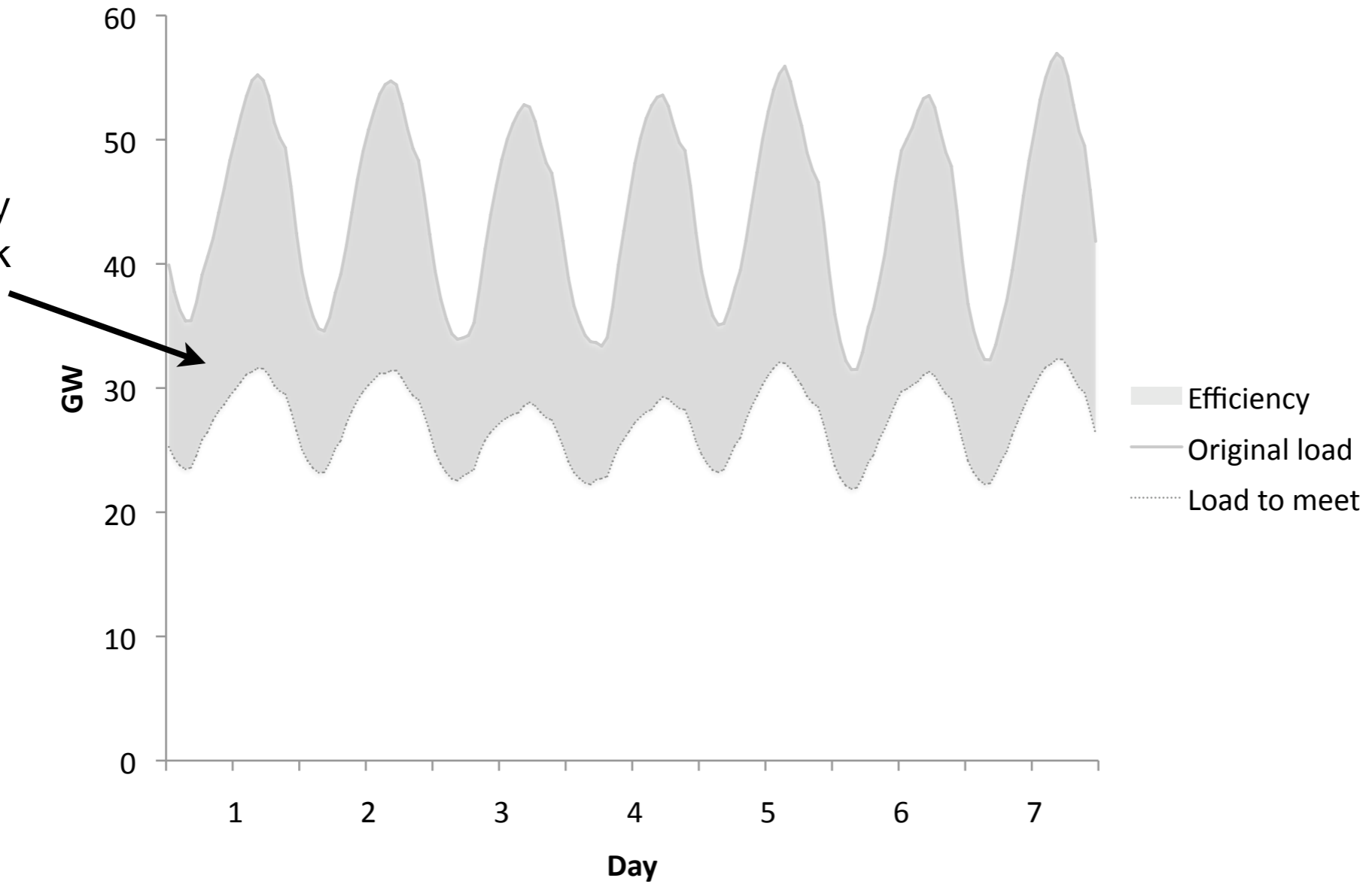
Grid integration with 80–100% renewables

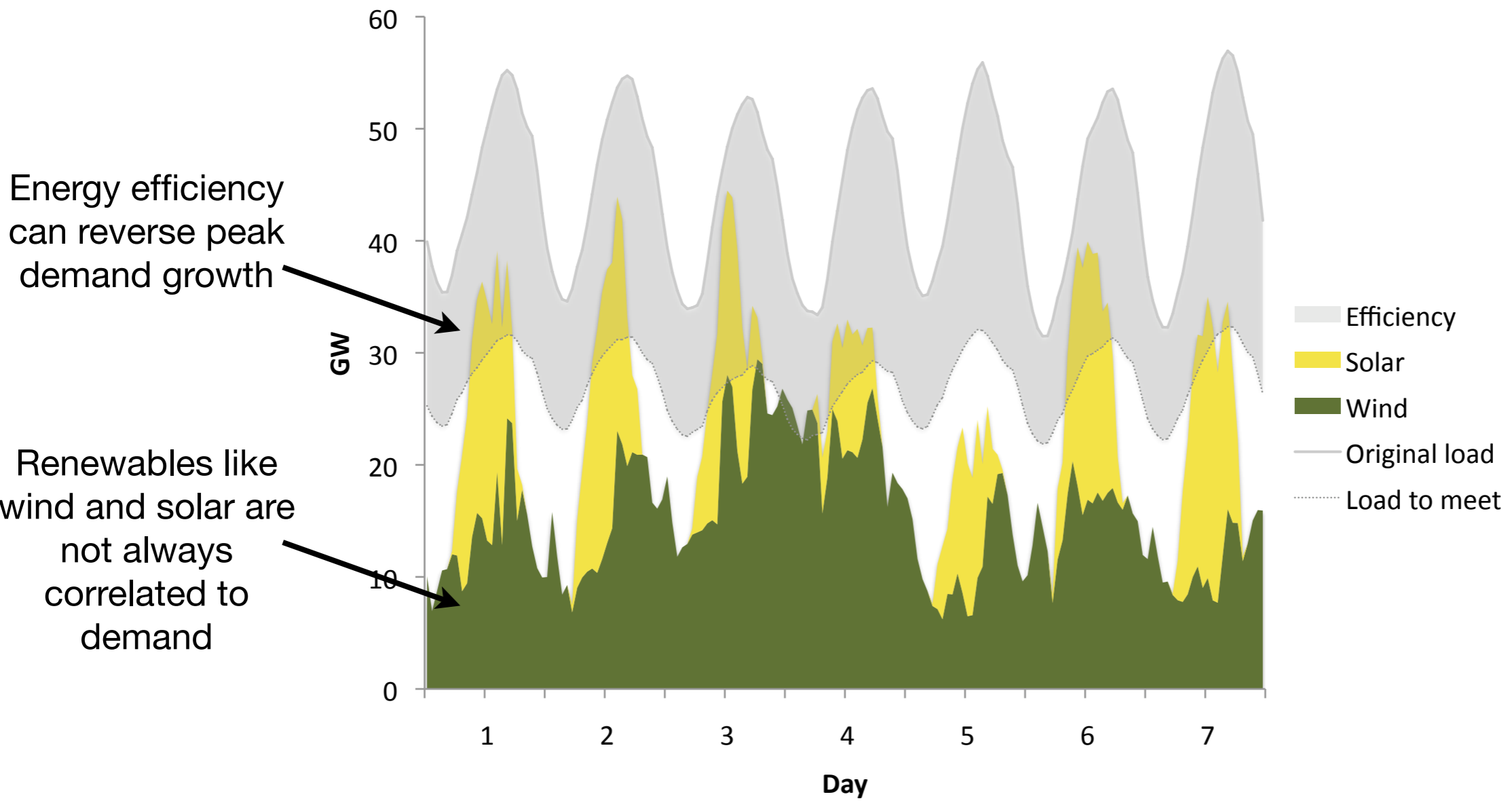
Amory B. Lovins

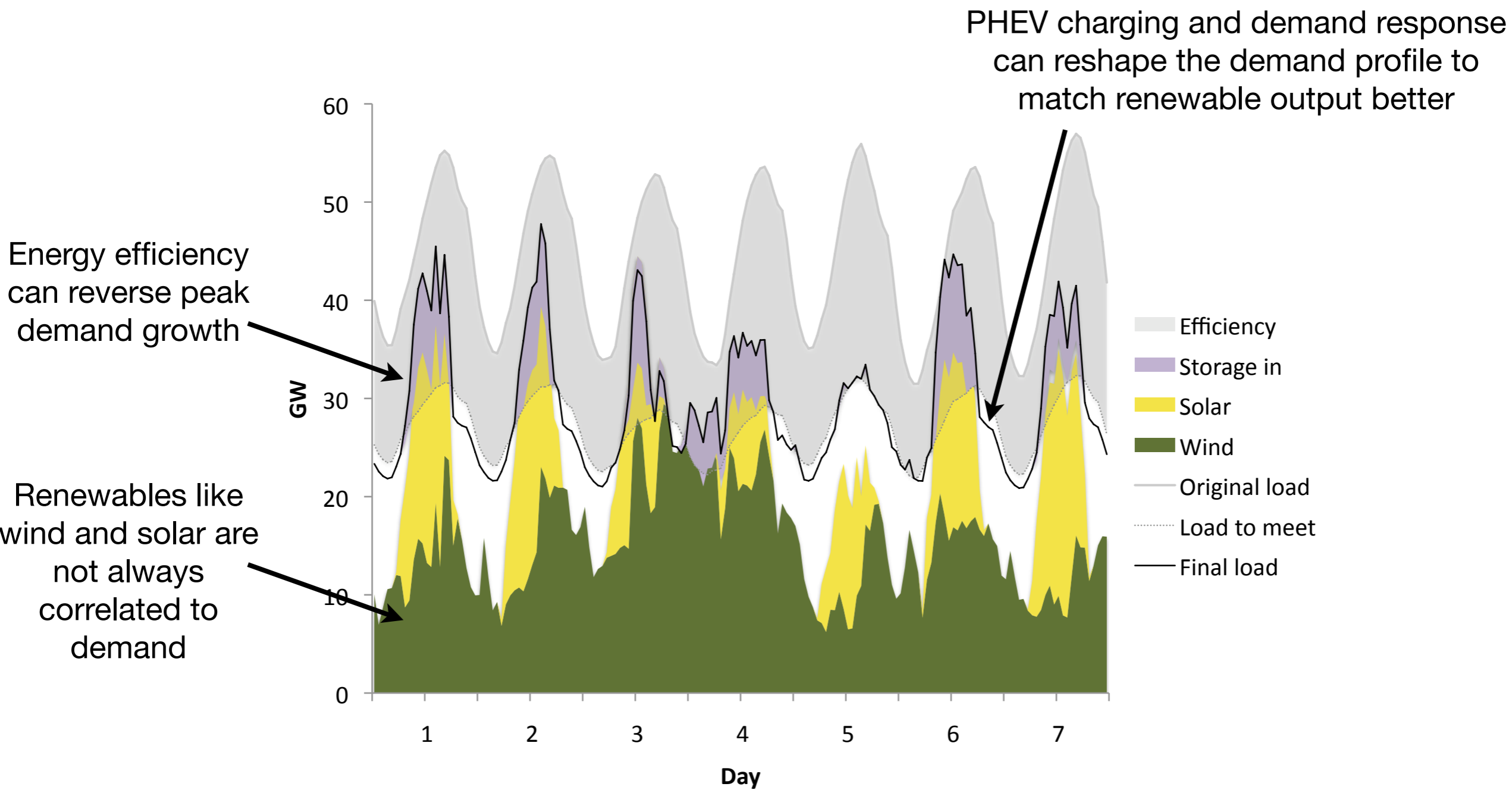
Chairman and Chief Scientist, Rocky Mountain Institute
Japan Renewable Energy Foundation, Tokyo, 14 Sept 2011



Energy efficiency
can reverse peak
demand growth







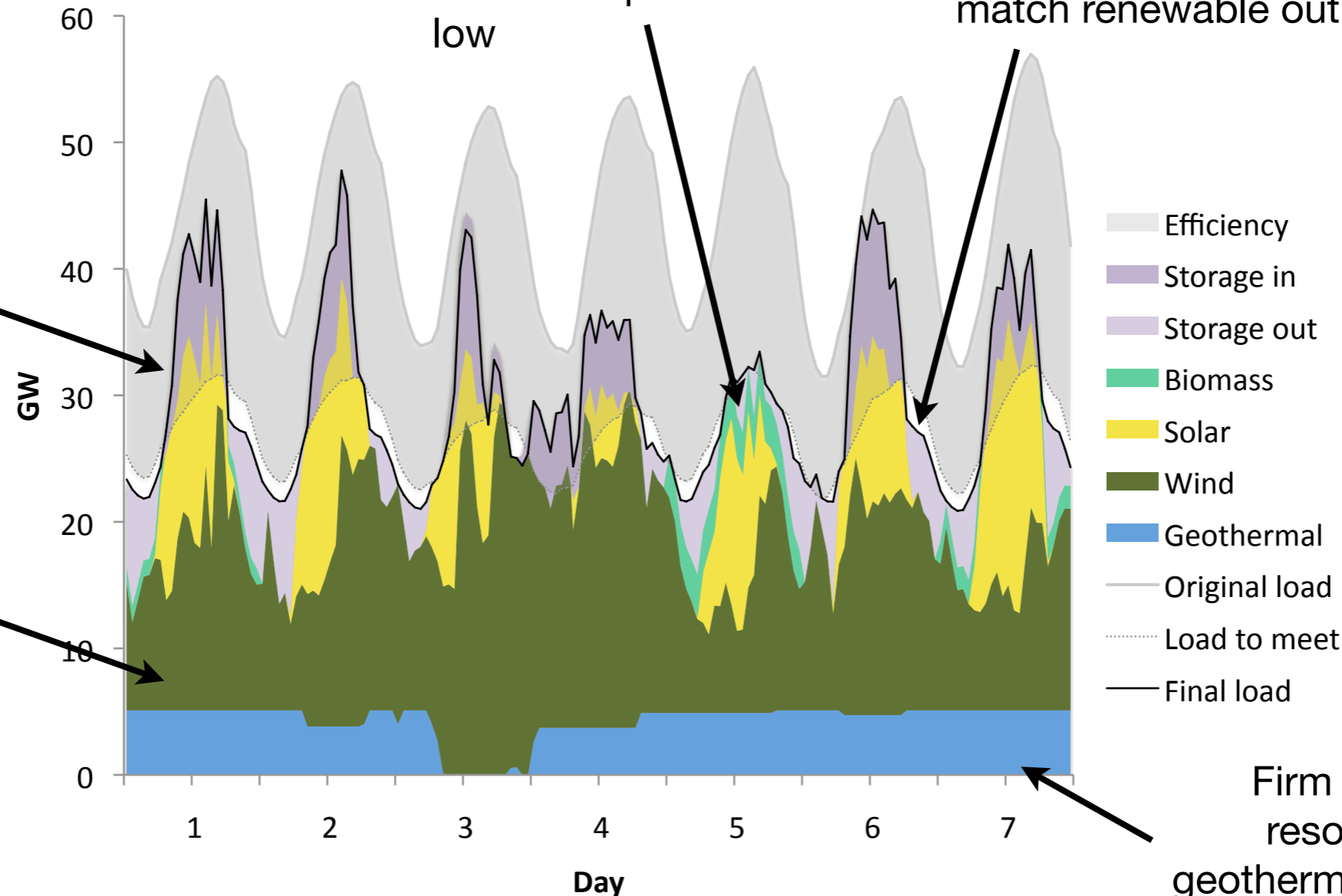
Storage discharge and flexible biomass can meet peak demand when wind and solar output are low

PHEV charging and demand response can reshape the demand profile to match renewable output better

Energy efficiency can reverse peak demand growth

Renewables like wind and solar are not always correlated to demand

Firm renewable resources like geothermal, small hydro solar-thermal-electric, and biomass/waste-fueled power generation can be used to balance wind and solar



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- Consider North American history of changing grid frequency