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Sommario/riassunto	Energy systems have played an essential role in the history of human civilization. As our civilization evolves, energy systems are expected to adapt to the environment and desire of people for more sustainable development whilst meeting the ever-increasing energy demand of society. To address global warming and its threats to sustainable development to multiple ends, major economies around the world have announced low-carbon, carbon-neutral, or negative-carbon development targets. To meet these goals, the energy systems as we know them today need to undergo substantial structural changes in terms of the way primary energy is extracted from nature, converted to secondary energy, transmitted from conversion sites to end use, and shifted between time slots to coordinate supply and demand. The share of renewable and fossil energy in the overall energy portfolio could experience unprecedented structural change of a kind not witnessed since industrialization. To cope with this harsh transition, energy systems should be planned, designed, retrofitted, and operated in a revolutionary manner.This reprint aims to present the most recent advances in energy systems analysis towards low/zero/negative carbon emission targets via integration amongst different primary energy supplies, between multiple energy supplies and demands, across geographically separated regions, and over different time scales from seconds to seasons.