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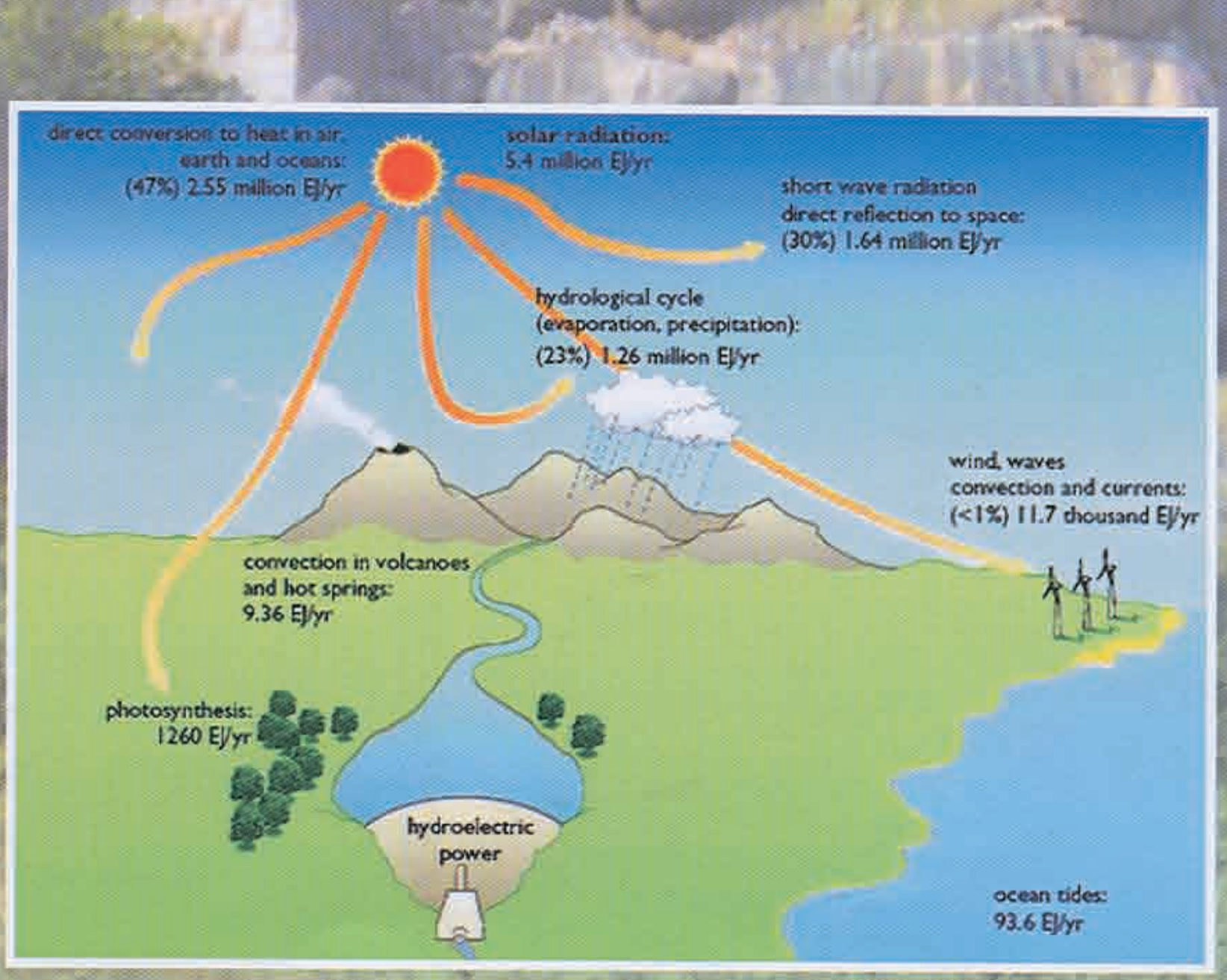

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Decentralized energy options for an ecologically fragile Himachal Pradesh, India

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Himachal Pradesh representing diverse topography, climatic conditions and vegetation is located in the western Himalayas. It is one of the highest consumers of bio-energy (fuel-wood, crop-residue, dung-cake) in the country resulting in increased environmental issues like excessive depletion of vegetation, desertification, indoor air pollution etc. The centralized electrification policies as well as the proposed hydro projects are posing serious threats to the already fragile ecosystem in the state[1].In this scenario, decentralized energy from renewable resource like solar helps meet the domestic and industrial energy requirements without damaging the environment. The solar energy potential in terms of incoming solar radiation has been assessed based on high resolution spatiotemporal (1°x1° global grid, 22 years) satellite derived datasets[2] which compensate for the lack of authentic ground measurements[3]. The data is represented as easily comprehensible solar maps using Geographical Information System (GIS). The study reveals that the period from March to October favor solar photovoltaic (PV) as well as domestic solar water heating and cooking applications throughout the state. The months of February and November, encouragingly support these applications in the regions below 3500m, while the winter months of December and January support only domestic water heating and cooking applications. This understanding of the solar energy potential helps designers and engineers to customize solar applications according to the seasonal and spatial variations of solar radiation within the state. Essentially, the study facilitates the intrusion of decentralized solar energy in Himachal Pradesh, safeguarding the deteriorating ecosystem and depleting resources.

References:

(2) R.K Aggarwal, S.S Chandel, *Energy Policy,* (**2010**) *38*, 2545
(3) NASA, Surface Meteorology and Solar Energy Release 6.0 Methodology, (**2010**), *<http://eosweb.larc.nasa.gov/sse/documents/SSE6Methodology.pdf>*
(4) Richard Perez, Robert Seals, Antoine Zelenka, *Solar Energy*, (**1997**) f50, 89