

Water-Energy Nexus: Energy Extraction from Water Towards Carbon Neutrality

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Abstract

The challenges of sustainable development include a water supply for healthy people, efficient use of water and energy resources, and protection of the ecosystem and environment. All must be resilient under climate change. The nexus between water and energy is a highly important element. The water sector exerts a heavy energy footprint (4% of global electricity consumption). Therefore, to offset this, there is a strong need to research energy recovery from water. Some methods are heat recovery, production of biogas and energy production from wastewater treatment such as pressure reduced osmosis (PRO) which will be the focus of this presentation. Up to 50% of the energy required for wastewater can be produced by biogas Production of energy and waste management, improvement of the potential for water reuse, protection of the environment, reducing carbon emissions and enabling the improvement of their environmental practices are all objectives. These research orientations will contribute and foster an integrated approach for understanding the water-energy nexus and enabling the design of carbon neutral or negative water treatment facilities.