### Country | Institute | Category | Related programs (with short summary) | Target / Goal Outcomes | Lead person / Organization | Partnership (if any) | Related information
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India | TERI | Hydrogen | Second generation hydrogen production from agri-residue biomass (2014-2019) | Developed a bioprocess for second generation hydrogen production from agri-residue biomass (wheat straw, rice straw, sugarcane bagasse, sugarcane trash) in 100 liter (0.1 m³) scale pre-pilot scale. Benchmark target: 1 mol of H₂ per mole of reduced sugar. Outcome/Achievement: 75% yield efficiency of the benchmark target. Further planned activity: Scale-up hydrogen production to pre-demonstration scale (10 m³ scale) and integration with downstream applications. | Dr. Sanjukta Subudhi/TERI | Looking for international partnership for further planned activities

### Cross-cutting Energy Transition Commission India – Hard-to-abate (HTA) sectors (2019-2022) [with a focus on hydrogen and Carbon Capture, Utilization, and Storage (CCUS) technologies across heavy industry] | | | Establish heavy industry sector roadmaps, detailing cost-effective pathways to decarbonisation using hydrogen and Carbon Capture, Utilization, and Storage (CCUS) technologies. | Dr. Girish Sethi/TERI | Analytical research being undertaken with support from Foundations

### India | TERI | Hydrogen | Solar driven Seawater Hydrogen Production and Producing Methane by Sequestering CO₂ | To develop an integrated prototype system for direct seawater electrolysis in combination with a standardised fixed bed reactor methanation process. | Dr. Poornam Sharma/TERI | Proposal has been submitted to Ministry of New and Renewable Energy.

### Hydrogen

  - TERI
  - Developed a bioprocess for second generation hydrogen production from agri-residue biomass (wheat straw, rice straw, sugarcane bagasse, sugarcane trash) in 100 liter (0.1 m³) scale pre-pilot scale. Benchmark target: 1 mol of H₂ per mole of reduced sugar. Outcome/Achievement: 75% yield efficiency of the benchmark target. Further planned activity: Scale-up hydrogen production to pre-demonstration scale (10 m³ scale) and integration with downstream applications.

- **Development of bioprocess for third generation hydrogen production from new 2nd and 3rd generation feedstock (2018-2021)**
  - TERI
  - To develop hydrogen production process from next generation non-edible feedstock (algae and aquatic macrophytes) in 1 m³ scale. Benchmark: 1 mol of H₂ per mole of reduced sugar. Goal: To reduce the overall process cost through integration with value added biocommodity production.

- **Energy Transition Commission India – Hard-to-abate (HTA) sectors (2019-2022) [with a focus on hydrogen and Carbon Capture, Utilization, and Storage (CCUS) technologies across heavy industry]**
  - TERI
  - Establish heavy industry sector roadmaps, detailing cost-effective pathways to decarbonisation using hydrogen and Carbon Capture, Utilization, and Storage (CCUS) technologies.

- **Solar driven Seawater Hydrogen Production and Producing Methane by Sequestering CO₂**
  - TERI
  - Proposal submitted to Ministry of New and Renewable Energy (MNRE) with a time duration of 4 years.