Center of Excellence In Water Treatment and Waste Water Management

Vision

To develop, design and demonstrate high efficient and sustainable, high-recovery and low-cost systems for saline, agricultural, domestic and industrial wastewater treatment and management.

Mission

The focus for developments will be in the arid state of Gujarat and Rajasthan where surface water resources are very scarce. Cost-effective technologies and systems will be explored with the aim of lowering energy costs through improvements in energy efficiency, novel multi- disciplinary approaches to water recycling, and use of renewable energy. Reject waste streams will be minimised or reduced to zero, thus protecting the environment.

Specific Objectives and Strategic Plan

Objectives:

- To create a Centre of Excellence in waste water treatment and management using multi-disciplinary approach
- Develop and introduce novel batch-reverse osmosis technology
- Develop and demonstrate Wind energy driven Reverse Osmosis
- Pilot small-scale (5–50 m^3/day) rurally-relevant low-cost systems for brackish groundwater
- Develop phyto-technology solutions for rural domestic wastewater treatment
- Combined electro- chemical process (Electro coagulation and electro- oxidation)
- Develop and facilitate the evolution of business models

Expected outcome:

- Exploitation of most suitable existing innovative and affordable solutions
- Solution for Drinking water purification with a focus on emerging pollutants
- Waste water treatment, with scope for resource/energy recovery, reuse, recycle
- Water and energy efficient and cost-effective processes
- Understanding and assessing the impacts of the developed innovative solutions to society
- Center will benefit rural society
- Water testing and solution providing center
- Training modules will be arranged
- M Tech course focused on ‘water treatment and management’

Efforts Made as on the Date and Recourse Generation

Related Project Activity Reference	Activities done so far
Solar Powered High Recovery Desalination (SPHRD) to provide clean water- (DST/TM/WTI/2K15/219) PDPU funded by DST): Fund available- 63 lakhs	Prototype of a thermal energy (steam) driven batch- RO process is being fabricated near parking area 
Received financial grant of INR 1 lakhs from the office of Research and Sponsored Programme to develop small scale, wind energy driven high recovery ratio RO module.	Theoretical modelling is in progress. We are planning to focus on wind energy also to demonstrate feasibility to run an RO module using wind energy. Fabrication is to start soon near parking area.
Development of Multi Effect Distillation (MED) system using a ORSP fund of 2.5 Lakhs- A Phd student is involved	Thermal energy application in some specific cases may be explored with the experience in MED development
Another integrated unit of EC, Adsorption is proposed using ORSP fund of 2.5 lakhs- A Phd student is involved	Renewable energy driven application in some specific cases will be explored to cut down the cost of waste water traetment
Bioenergy: technological collaborations will be set up with agricultural universities. Banasthali University, Rajasthan, Anand Agricultural University and G B Pant agricultural University are in loop to explore the possibilities with the aim at water reuse for bioenergy in rural India.	We will use the facilities available with phytoremediation, bioenergy conversion, and halophytic plant technology management.

Research Grants

Title	Submitted Date	Duration (Years)	Scheme	Funding Agency	Total Grant Received	Date Of Starting	Likely Date Of Completion
Solar Powered High Recovery Desalination (SPHRD) to provide clean water-(DST/TM/WTI/2K15/ 219) funded by DST): Fund available-	July 2015	**3.0**	WTI	DST	**63 lakhs**	**April 16**	**November 19** (with 6 months extension)
Bio-mimetic and phyto-technologies Designed for low-cost purification and recycling of water (India-H_2O)	27-02-2018	**4.5**	EU- India Horizon 2020	DST/ DBT **(Accepted for funding)**	**11 crore**	**March 19**	**March 24**
Low Cost- Renewable Energy Driven (LC- RED) Water Treatment Solutions Centre	30-04-2017	**5**	Water-IC	DST	**5.3 crores**	**Feb 19**	**Feb 24**
Design, Development and Investigations of Energy Efficient Solar Water Distillation Unit	31-03-2017	**2**	Minor Research Project	GUJCOST	Proposal Submitted Sanction Awaited		
A complete solution for industrial waste water-approaching to Zero Liquid Discharge (ZLD) with water and energy savings schemes	15-03-2017	**3**	Water Technology Initiative (WTI)	DST	Proposal Submitted Sanction Awaited		

Project Partners Developed So Far

Academics, Labs, NGOs

S. No	Organisation name	Country
1	ASTON UNIVERSITY, BIRMINGHAM, UK	UK
2	CENTRAL UNIVERSITY OF GUJARAT	IN
3	PLATAFORMA SOLAR DE ALMERÍA (CIEMAT), SPAIN	ES
4	BANASTHALI UNIVERSITY, RAJASTHAN	IN
5	NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE (NEERI)	IN
6	UNESCO-IHE. (IHE)	DK
7	GB PANT UNIVERSITY OF AGRICULTURAL TECHNOLOGY (GBP)	IN
8	CSIR-CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE (CEERI)	IN
9	MODUS RESEARCH AND INNOVATION (MOD)	UK
10	BEN GURION UNIVERSITY (BGU), ISRAEL	IS
11	ACWADAM (ACW), CHENNAI- NGO	IN
12	JADAVPUR UNIVERSITY (JU), CALCUTTA	IN
13	FUNDACION CENTRO TECNOLOGICO DE INVESTIGATION MULTISECTORAL (CITEM), ISRAEL	ES

Industries

S. No	Organisation name	Country
1	AQUAPORIN (AQP), DENMARK AND INDIA	DK
2	AQUAPORIN ASIA (AQPA), INDIA	SG
3	ACONDICIONAMIENTO TARRASENSE ASSOCIACION (LEITAT)	ES
4	ARVIND TAXTILE MILLS	IN
5	DAVEY (DAV), CHENNAI	IN
6	ENVIROCHEM SERVICES (ECS), AHMEDABAD	IN
7	GUJARAT CHEMICAL ASSOCIATION (GCCI)	IN
8	MADHUR MILK DAIRY (MMD)	IN
9	SIMPOLO CERAMICS, MORBI	IN
10	LEXICON CERAMICS	

INDIA- H2O Consortium Partners

Participant No	Participant organisation name	Country
1 (EU-CO)	UNIVERSITY OF BIRMINGHAM (UOB)	UK (UNITED KINGDOM)
2 (IND-CO)	PANDIT DEENDAYAL PETROLEUM UNIVERSITY (PDPU)	IN (INDIA)
3	ASTON UNIVERSITY (AU)	UK (UNITED KINGDOM)
4	PLATAFORMA SOLAR DE ALMERÍA (CIEMAT)	ES (ESPAIN)
5	NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE (NEERI)	IN (INDIA)
6	AQUAPORIN (AQP)	DK (DNMARK)
7	AQUAPORIN ASIA (AQPA)	SG (SINGAPORE)
8	UNESCO-IHE. (IHE)	NL (NETHERLAND)
9	ACONDICIONAMIENTO TARRASENSE ASSOCIACION (LEITAT)	ES (ESPAIN)
10	GB PANT UNIVERSITY OF AGRICULTURAL TECHNOLOGY (GBP)	IN (INDIA)
11	CSIR-CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE (CEERI)	IN (INDIA)
12	ARVIND MILLS (ARV)	IN (INDIA)
13	MODUS RESEARCH AND INNOVATION (MOD)	UK (UNITED KINGDOM)
14	BEN GURION UNIVERSITY (BGU)	IS (ISRAEL)
15	DAVEY (DAV)	IN (INDIA)
16	ACWADAM (ACW)	IN (INDIA)
17	JADAVPUR UNIVERSITY (JU)	IN (INDIA)
18	ENVIROCHEM SERVICES (ECS)	IN (INDIA)
19	GUJARAT CHEMICAL ASSOCIATION (GCCI)	IN (INDIA)
20	MADHUR MILK DAIRY (MMD)	IN (INDIA)
21	FUNDACION CENTRO TECNOLOGICO DE INVESTIGATION MULTISECTORAL (CITEM)	ES (ESPAIN)