



EWEF - SusTech

Dr B Ntsendwana
(Managing Director)

BACKGROUND

PhD in Chemistry (2014)- University of Johannesburg

Post doctoral (2014-2015)-University of the Western Cape

Senior Lecturer (2016-2018)- University of South Africa

FIELDS OF STUDY

FUEL CELL TECHNOLOGY, SENSORS, WATER TREATMENT

✓ SUPERVISE 5 PhD and 6 MSc Postgraduates

Research vs. Innovation

- ✓ Innovation is the complex process of introducing novel ideas into use or practice
- ✓ Innovation occurs at the intersection of invention and insight; it's about application of invention
- ✓ Knowledge applied to tasks that are new and different is Innovation

Research is the transformation of money into knowledge

Innovation is the transformation of knowledge into money !!!!

How women are impacted by Innovation

Innovation and the empowerment of women?

- modern contraceptives
- improvements in childcare provision
- quotas to ensure parity in educational institutions and representative bodies,
- improved women's incomes, health, wellbeing and opportunities.

Women in Innovation

- Breaking down barriers to women's creative capacities is the first step in their emergence in the field of innovation.
- Innovation is cyclical. The **more women innovate**, the **more they inspire and allow other women** to innovate.
- Cultivating innovation to empower women and encourage gender equality allows leaders, businesses, governments, and women themselves to create new solutions to difficult problems.

Let's innovate for the future of women.

Let's innovate for the future of our world.

Team Members

ESTABLISHED in June 2018

TEAM MEMBERS

- Dr Bulelwa Ntsendwana (Managing Director)
- Dr Alex Kuvarega (Senior Scientist)
- Dr N Mketso (Senior Instrumentalist)
- Mr Potlako John Mafa (Research Scientist)
- Ms Katlego Mamogomotsi Semenya (Engineer)
- Ms Kholiswa Yokwana (Laboratory Scientists)
- Shiela Plaatjie (Financial planning)

Sustainability

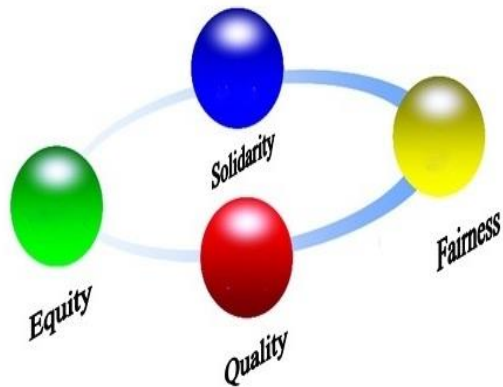
Sustainability is a state of a complex, dynamic system. In this state a system can continue to flourish without leading to its **internal collapse** or requiring inputs from outside its defined system boundaries.



Applied to our civilization, this state is consistent with an equitable and healthy society, as well as thriving ecosystems and a beautiful planet.”

Three pillars of sustainability

Sustainable Business Practices



— Figure 1. Definitions of sustainable development

WHAT IS TO BE SUSTAINED:	FOR HOW LONG?	WHAT IS TO BE DEVELOPED:
NATURE Earth Biodiversity Ecosystems	25 years "Now and in the future"	PEOPLE Child survival Life expectancy Education Equity Equal opportunity
	Forever	
LIFE SUPPORT Ecosystem services Resources Environment	LINKED BY Only Mostly But And Or	ECONOMY Wealth Productive sectors Consumption

SOURCE: U.S. National Research Council, Policy Division, Board on Sustainable Development, *Our Common Journey: A Transition Toward Sustainability* (Washington, DC: National Academy Press, 1999).

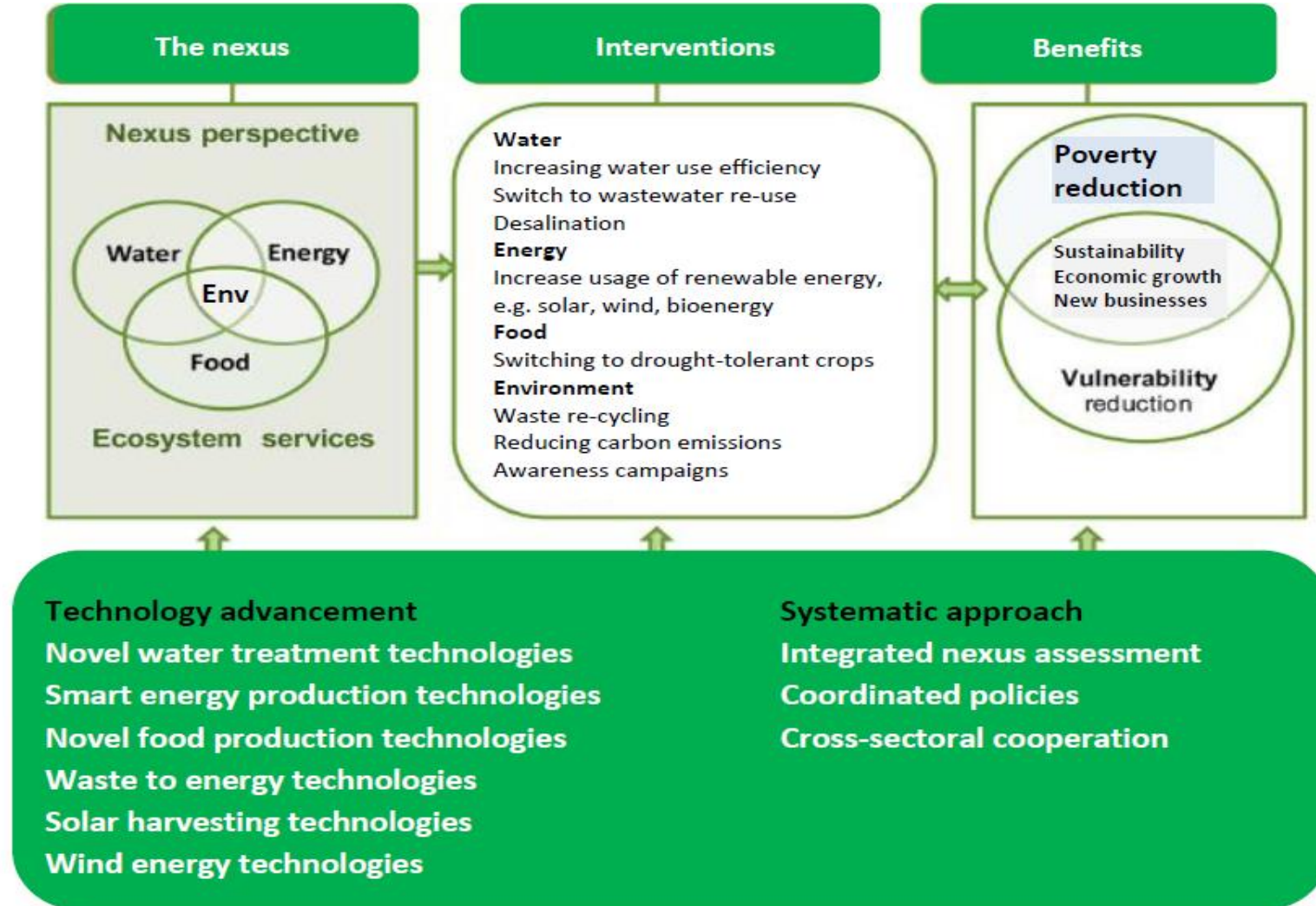
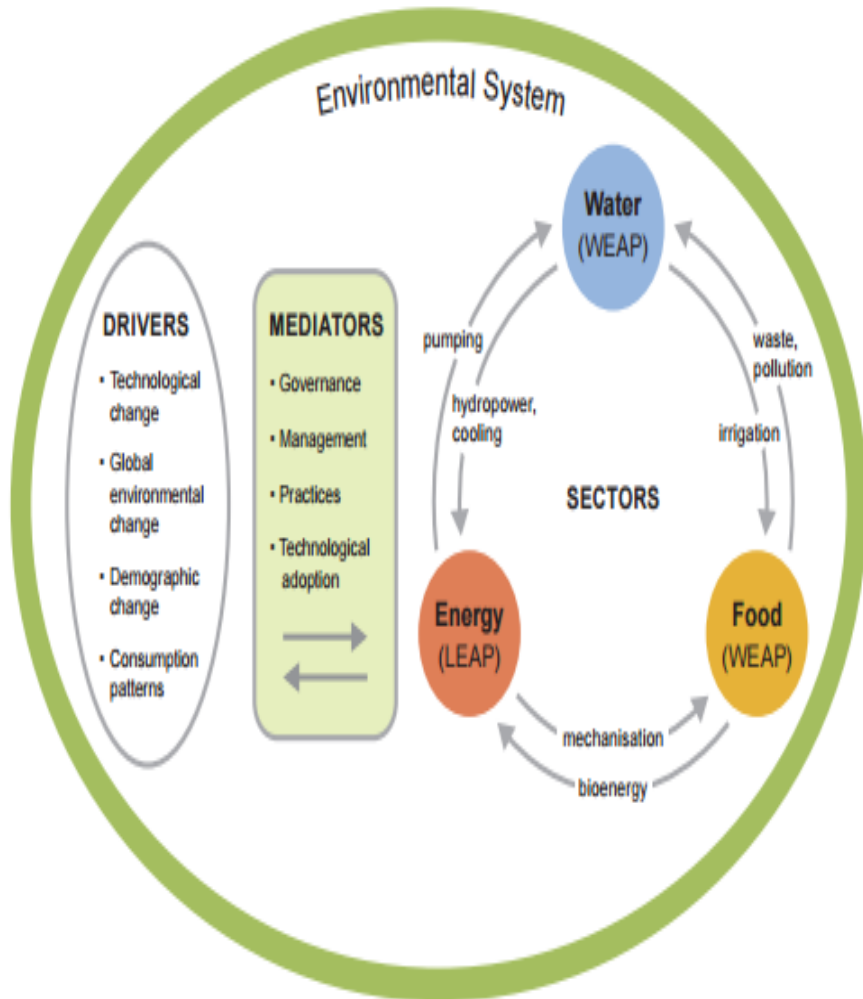
Vision

Creating a world of **social** and **economic prosperity**
sustained through collective action

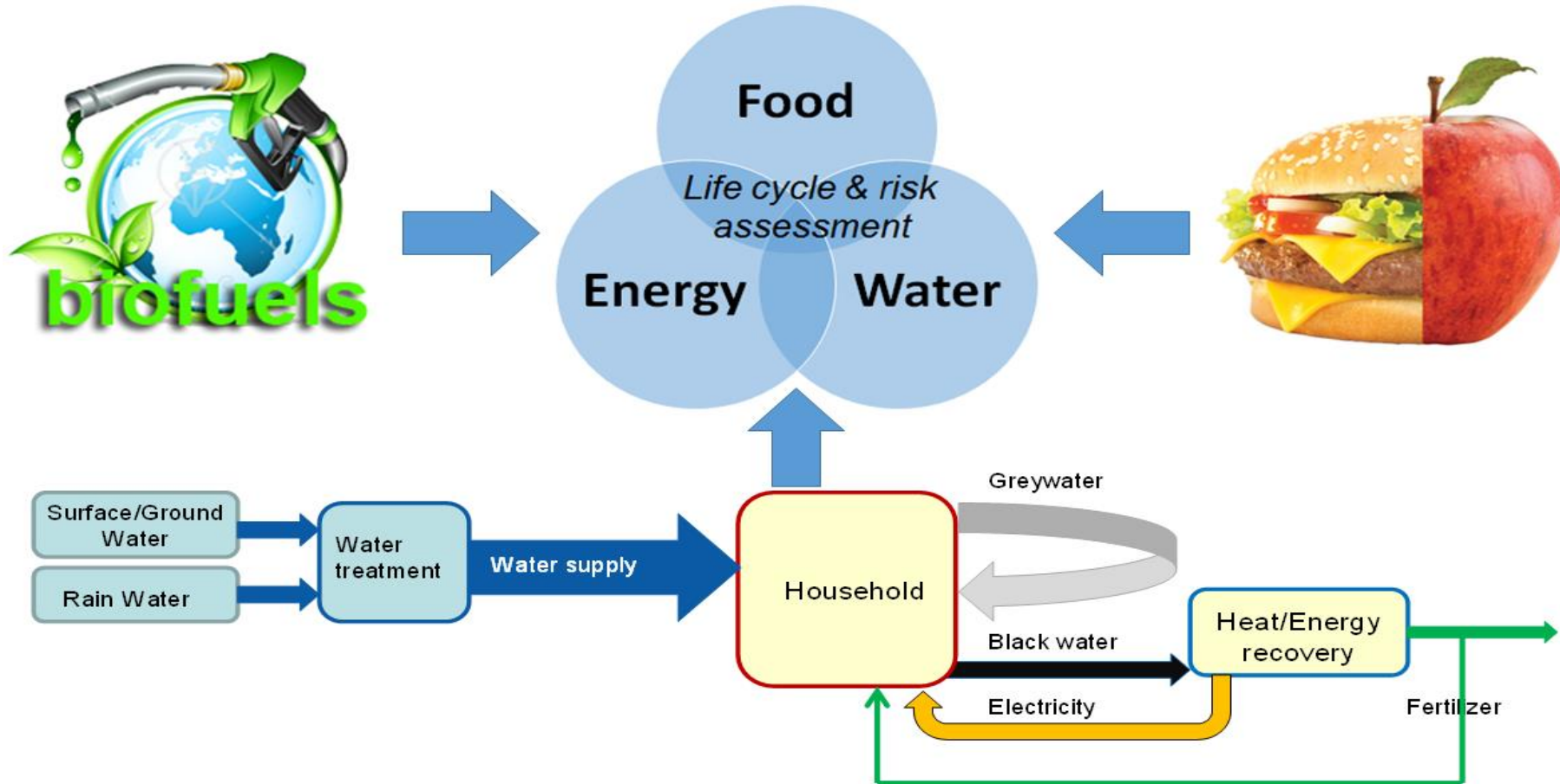
Global Challenges



EWEF-SusTech Approach



EWEF-SusTech **Global** Footprint



Water related Innovations

Water and wastewater treatment technologies

- ✓ Removal
- ✓ Desalination
- ✓ Disinfection

Sensors technologies

- ✓ Heavy metal
- ✓ Organics

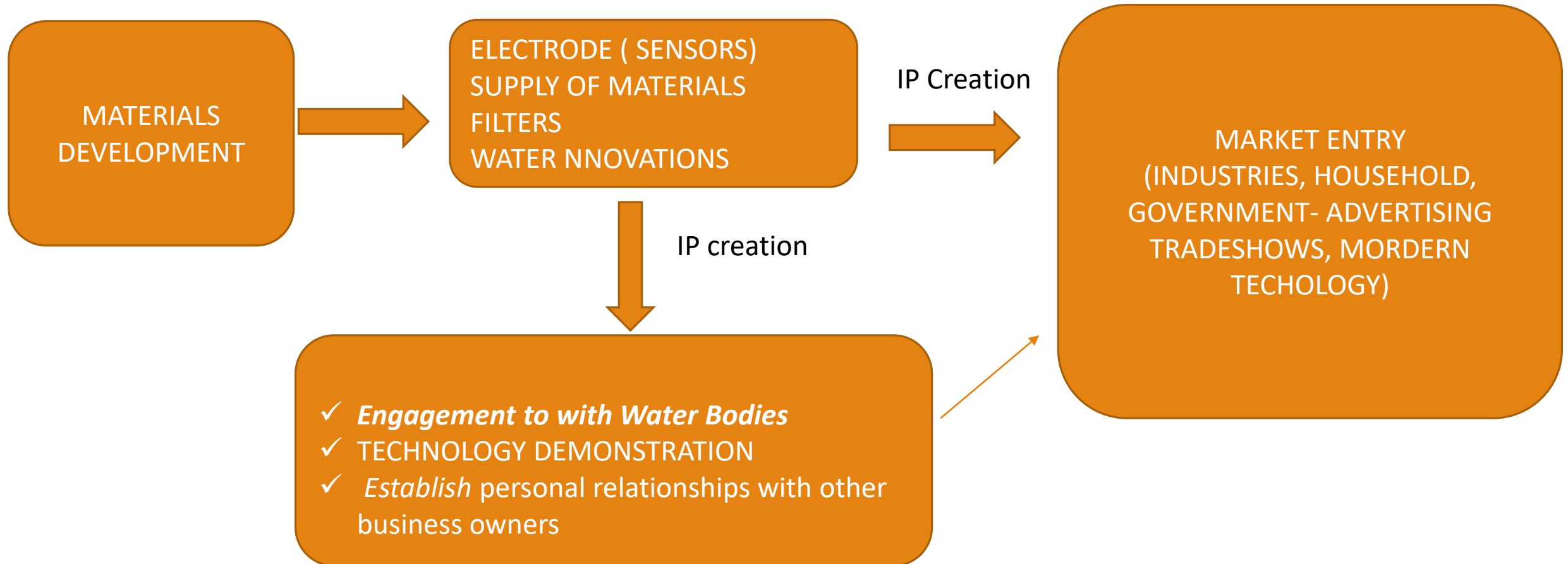
Product Description

EWEF-SusTech offers water treatment technologies for purification of wastewater from textile industry, municipality and household as follows:

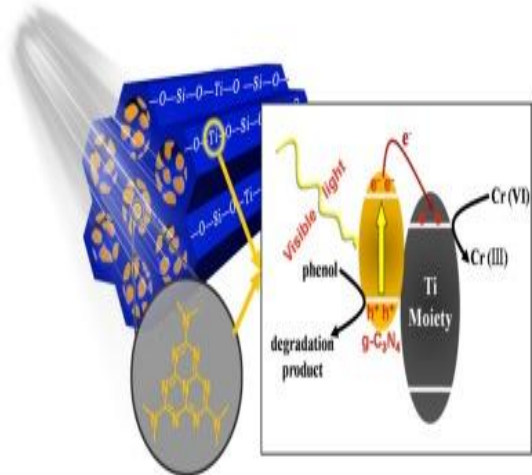
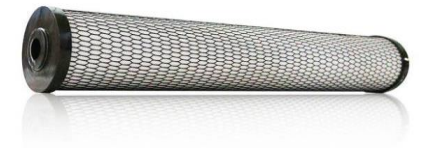
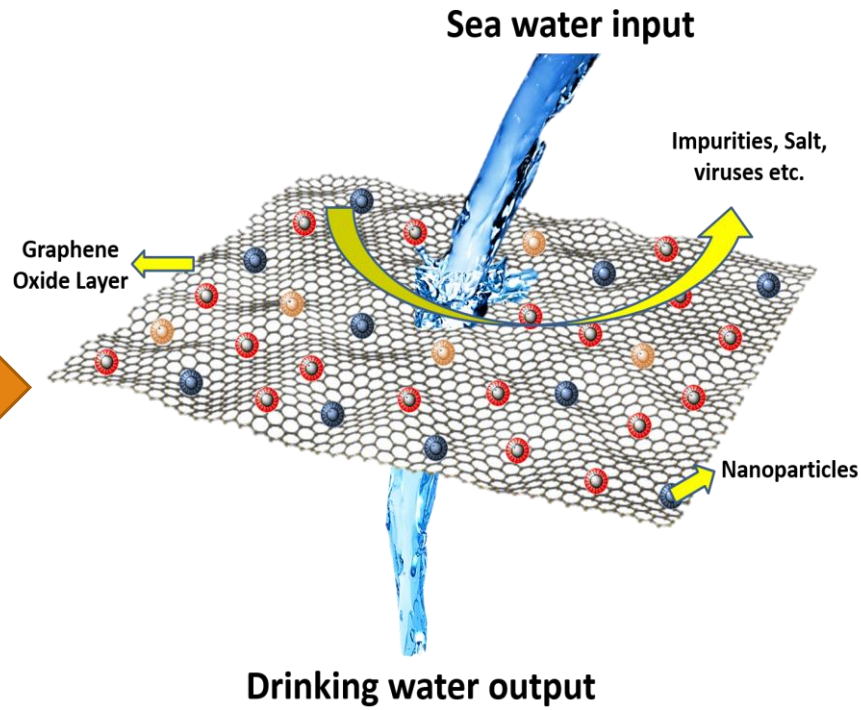
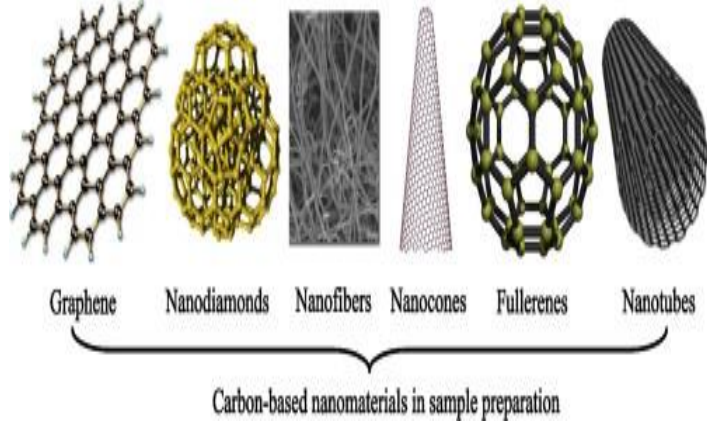
- Carbon based filters -(Office, hotels, Apartments
- Visible light driven - photocatalytic filters (portable)
- Photoelectrochemical Reactors (Industries, municipalities)
- Photocatalytic membrane integrated systems (Industries, municipalities,)

These technologies are based on nano-engineered materials for better performances efficiencies than conventional methods

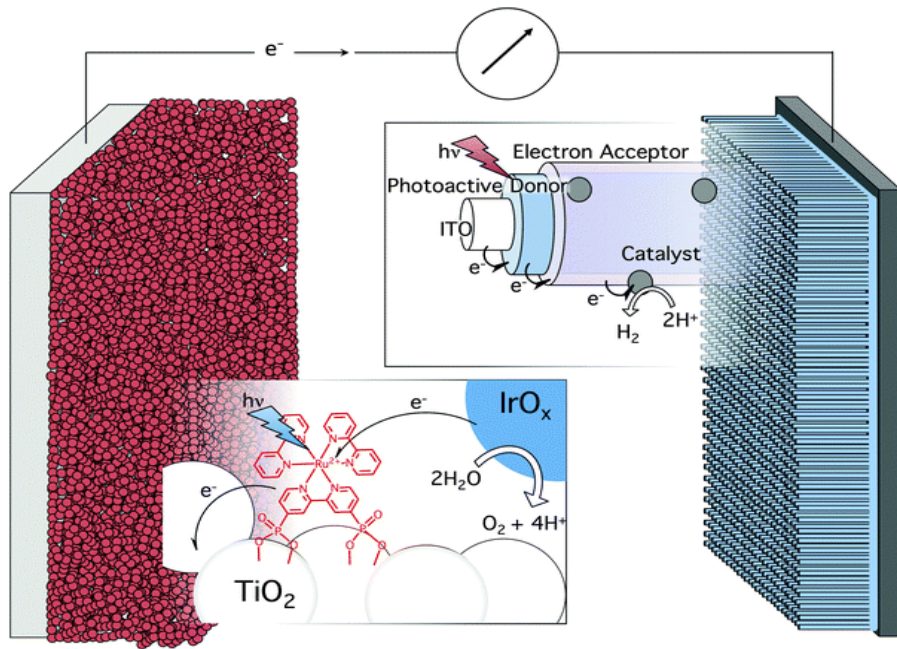
Route



Development of Nanomaterials

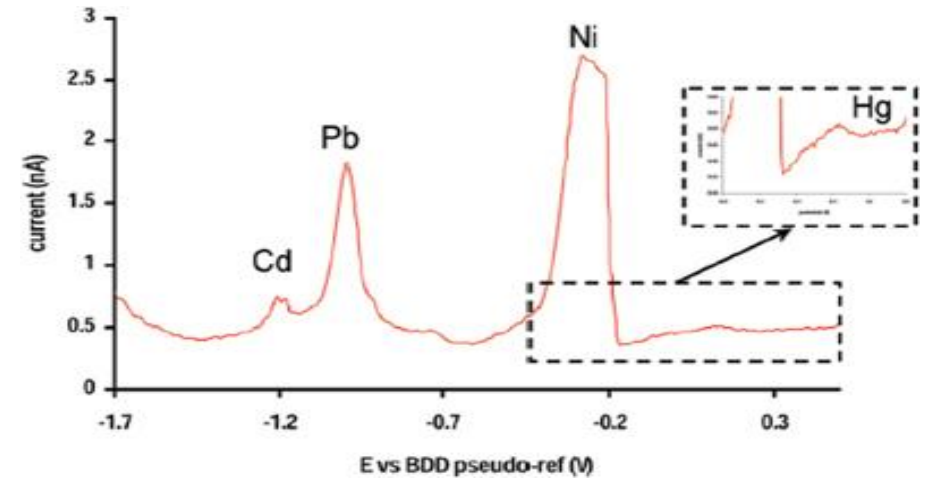


Photo/electro-Integrated systems

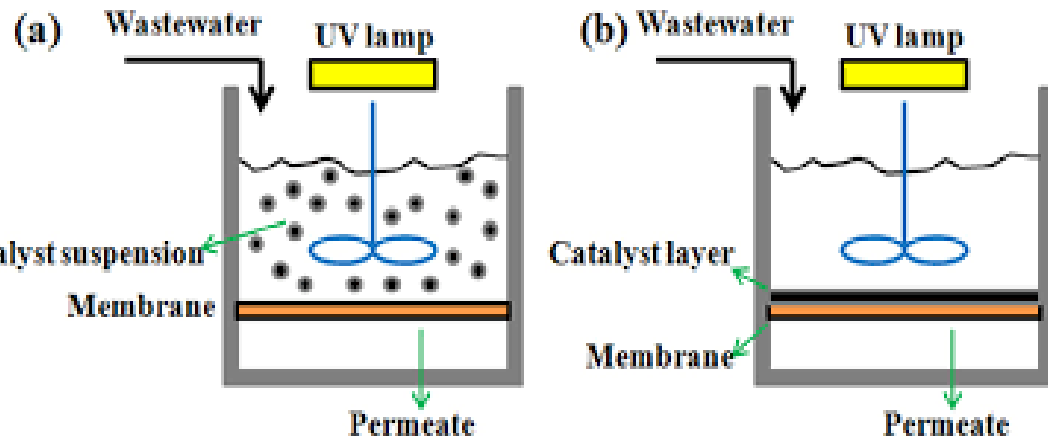


A photo-electrode

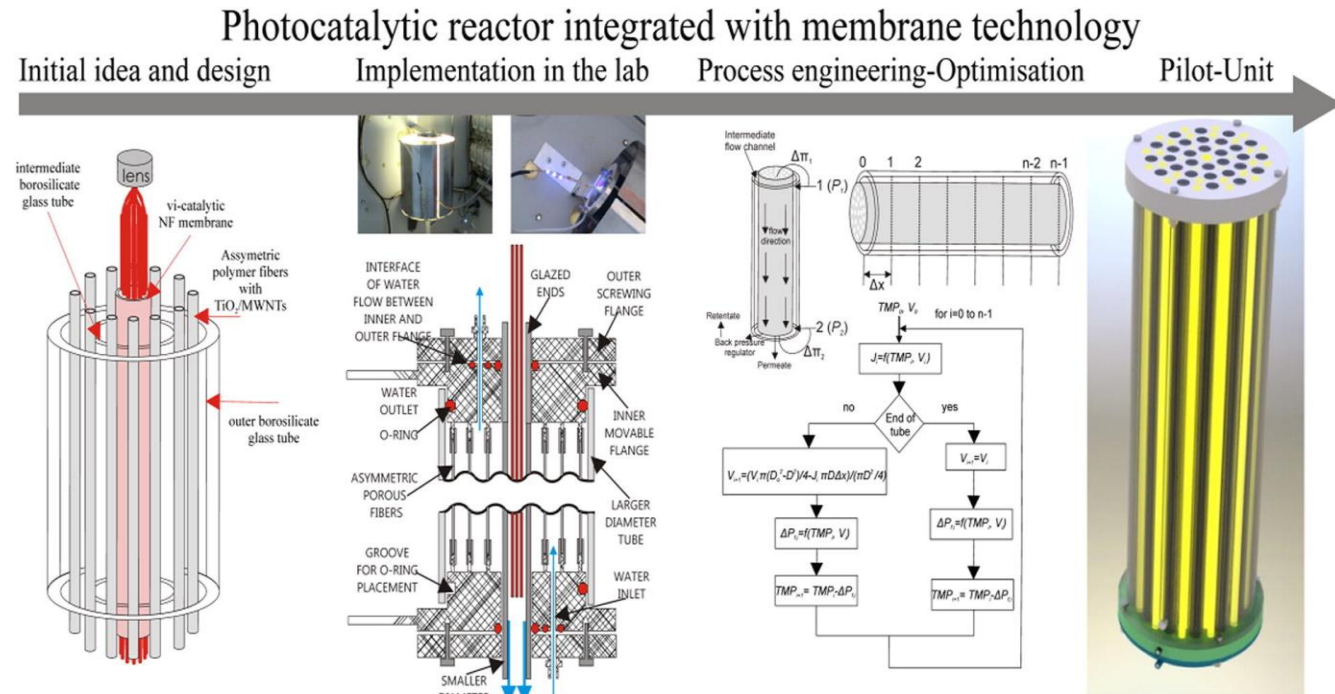
The electrodes can be also tailored for specific environmental analysis



Photocatalytic membrane integrated systems



- ✓ Enhancing the membrane performance and improve its life span- through incorporation of nanomaterials (catalytic and/or photoactive)



Commercial systems



EWEF-SusTech Water



PROGRESS

- Secured a laboratory space
- Supplying carbon black materials
- Fabrication of the electrode (Mintek)
- Designing of the photo-reactor prototype

CHALLENGES

Portable devices

- BOD, TOC and COD analysers
- Conductivity and pH meters
- Dissolved CO₂ and Dissolved oxygen meters
- Total hydrocarbon analyser
- Turbidity meters
- Plant Nutrient Meters – Potassium and Nitrate Ions
- Heavy metal sensors/Voltammeters
- Spectroquants

Stationery Equipments

- ✓ IC/ICP-MS
- ✓ FT-Raman
- ✓ UV-Vis
- ✓ LC-MS/HPLC/GCxGCx-TOFMS
- ✓ TOC
- ✓ Potentiostat

THANK YOU

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