



Innovative Processes and Practices for  
Wastewater Treatment and Re-use



## Panel Discussion

### **“Routes from lab to field in wastewater treatment: What can be done in Mediterranean Partner Countries”**

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Innovative Processes



- Sounds intellectual.
- May bring us respect.
- Impressive, thought-provoking and possibly interesting.
- But, not concise.



## Creativity vs. Innovation



- Creativity is often substituted for innovation.
- Innovation typically involves creativity, but is not identical to it.
- Innovation involves successful implementation of creative ideas.



## What, then, is innovation?



Classic definitions of **innovation** include:

- *Act of introducing something new* (The American Heritage Dictionary)
- *Successful exploitation of new ideas* (UK Department of Trade and Industry)
- *A creative idea that is realized* (F. Johansson Harvard Business School Press, 2004)
- *Process of translating new ideas into tangible societal impact*
- *A better way to deliver value* (S. Kaplan, Business Innovation Factory)



## Something New



- Must be substantially different, not an insignificant change.
- Innovation occurs when someone uses an invention - or uses existing tools in a new way - to change how people conduct their lives.



## Invention vs. Innovation



“While invention is the first occurrence of an idea for a new product or process, innovation is the first attempt to carry it out into practice.”

J. Fagerberg, D. C. Mowery and R. R. Nelson:  
The Oxford Handbook of Innovations. Oxford University Press, 1-26, 2004.  
ISBN 0-19-926455-4.



## Innovation vs. Economy



In current business literature, an innovation is not an innovation until someone successfully implements and makes money on an idea.



## Sources of Innovation



- Traditional source is the manufacturer. Businesses innovate in order to sell the innovation.
- End-user innovation is another source recognized recently. A person and/or a company develop an innovation because the existing products do not meet their needs.



## The Drive for Innovation



- Regardless of what exactly drives it, innovation itself is a major driver of the economy.
- Whether innovation is mainly supply-led (based on new technological possibilities) or demand-led (based on social needs and market requirements), the often unspoken goal of innovation is to solve a problem.



## Risk



Other than economical concerns, innovation typically involves a risk associated with a negative effect on the old practices.



## “Typical Innovations”



- Department of the Environment and Water Resources of the Australian Government recently organized a contest on wastewater innovations.
- 185 case studies have competed.
- Five projects were declared as successful.



## Wastewater Innovations



- Spearwood WWTP
- Bayswater Artificial Wetlands
- Rottnest Island WWTP (“CASS”)
- Denmark WWTP (“IMNR”)
- Production of Industrial Grade Water using Woodman Point WWTP Effluent



## Wastewater Innovations



### Spearwood WWTP

- Application of high-rate anaerobic treatment to reduce organic content of animal processing wastewaters, prior to additional aerobic treatment.
- High-rate anaerobic treatment process, called the HYBRACTOR (marketed by ESI Ltd.) was designed and operated to centrally treat the wastewater streams from such plants.



## Significance



- As environmental regulations tighten, high-strength industrial wastes pose increasing problems.
- Traditional and better understood aerobic processes cannot be used alone for waste streams containing a high concentration of organic matter, because costs of supplying sufficient oxygen increase markedly as do the costs of sludge disposal.
- Anaerobic processes alone do not reach the low BOD and SS values required for discharge to the receiving water bodies.



## Significance



- Aerobic treatment converts around half of the incoming mass of organic pollutants into new bacteria (biomass), utilising oxygen in the process.
- Anaerobic treatment, on the other hand, converts only around 5% of the incoming organic pollutants into biomass and does not use oxygen.
- In addition, anaerobic processes generate a methane rich gas, which has potential energy and economic value.



## Significance



- In general terms, Turkey has been slow to embrace anaerobic treatment technology.
- Providing an effective demonstration of the high-rate anaerobic treatment can assist the technology transfer process.