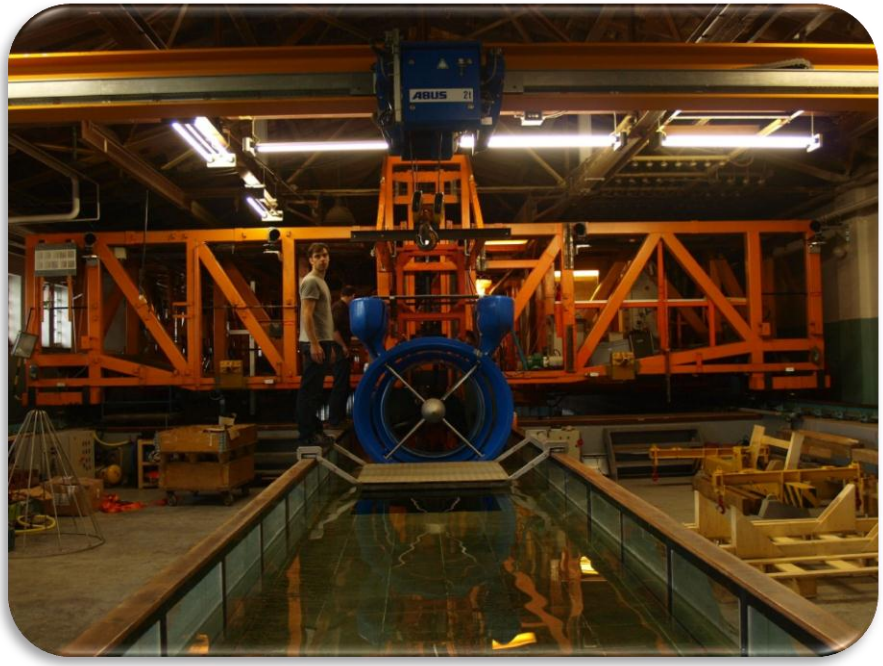
International Applications of the SMART Turbine

Extensive Testing in Tow Tank (SVA)

1. Power curve
2. Dynamic forces
3. Anchor forces
4. Vibrations
5. Stress tests



Commercial Projects and Tests

- Tests:

1. Krämersche Kunstmühle, Germany since September `11

- Commercial:

1. Perlen Papierfabrik, Switzerland since June ´12
2. Rosenheim am Inn, Germany, since April ´13
3. Salvajina Dam (Hybrid Project with Energy Utility EPSA) since July ´13

- **In Planning**:

1. Bonn on the Rhine: (E-Charging Station with Municipality Bonn) Pending permit: realization Fall 2013
2. Wasserburg on the Inn: (Modular project with private customer) Pending permit: realization Fall 2013

Krämer´schen Kunstmühle

1. Installed since Sept ´11 in front of existing HPP (130 kW)
2. Anchoring with steel cable above water surface
3. Excessive debris occurance
4. Tests with different debris protection and electrical components
5. No measurable affects on the HPP behind turbine

Perlen Paper Factory

1. Since June 2012 behind HPP (1 MW)
2. Anchoring with cement anchor on canal ground
3. Injection in the low voltage grid
4. Little debris problems
5. No measurable effects of the HPP ahead
6. Consistent production of 500 watts , low velocity

Inn: testing the new design

1. Installation April 2013 with a 3 year permit
2. Weighted anchor of 2 tons
3. Cooperation with Verbund Kraftwerke, Austria
4. Turbine dives once water level rises to a certain level, avoiding damaging debris
5. Survived the century flood and rain period of June 2013 without any damage

EPSA Colombia: Hybrid Solution

1. Installation behind Salvajina Dam and HPP (300 MW)
2. Partnership Battery Manufacturer (MAC) and Energy Utility (EPSA)
3. Hybridinstallation Hydro, Diesel, PV
4. Anchoring with steel cable above water surface
5. Approx. 200 m behind turbines
6. Constant 2 m/s = 2 kW

In Planning: Modular Private Project

- Wasserburg, Inn
- Average 1.8 m/s
- Application for six (6) Turbines
- Injection at a private household
- Castle is heritage listed – so no wind or solar power allowed, turbines are great alternative

In Planning: E-Bike Charging Station Bonn

1. The city of Bonn has sponsored 300 E-bikes
2. Using the Rhine to charge E-Bikes
3. First tubrine will be installed at the boat landing (could be repeated many times throughout the Rhine)
4. Low power requirement of station is good for slower rivers

Other past references

1. San Martin, Peru Amazonas Jungle (electrification project of a village – 1 turbine)
2. Borneo, Indonesia Jungle (electrification project of a village – 2 turbines)
3. Punjab, India (electrification project in canal system – 1 turbine)
4. Manaus, Brazil Amazon Jungle (electrification project of a chocolate factory – 1 turbine)

ENY STB
TECHNOLOGY

Nitin Umesh (Group Chairman & Founder)

Email :

nitin@stbtechnology.com

Info@stbtechnology.com

Website :

www.stbtechnology.com