US EPA ARCHIVE DOCUMENT

Water Clusters Meeting

March 25th 2014

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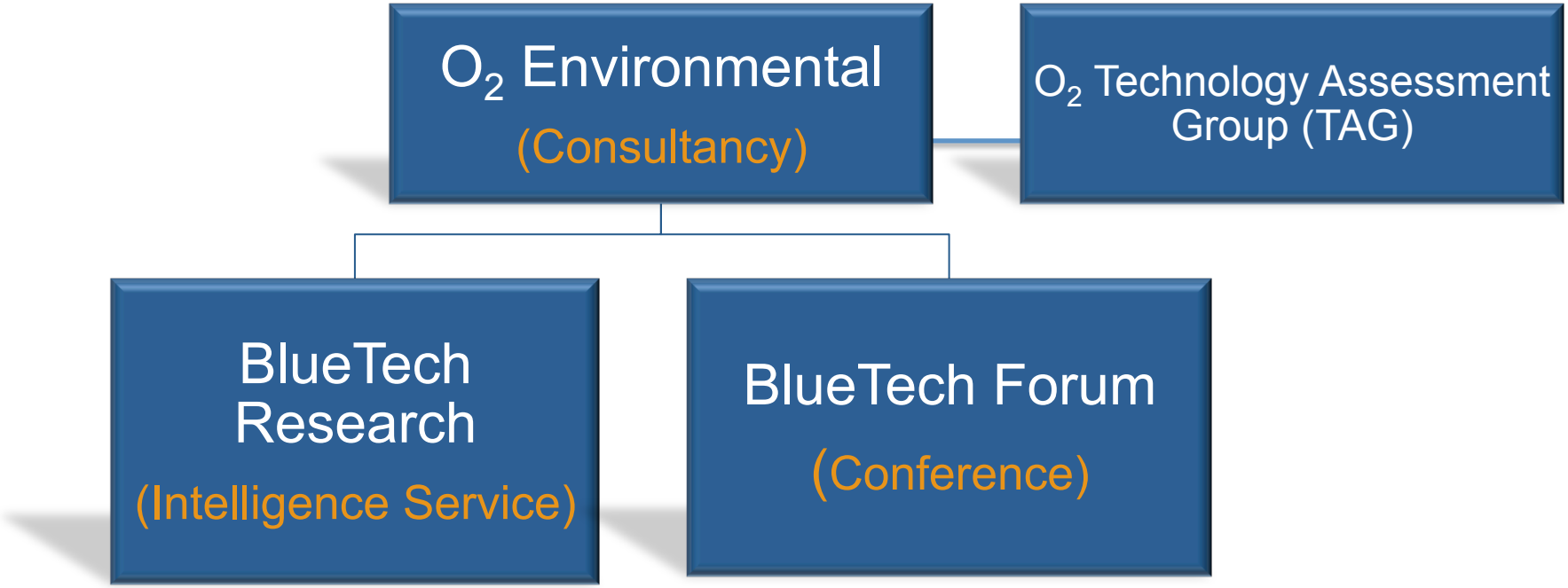
O_2 Environmental Corporate Overview



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What we do

Actionable Water Market Intelligence & Strategic Support

BlueTech Research

- BlueTech Innovation Tracker
- Company Reports
- Monthly Intelligence Briefings
- Insight Reports on Markets & Technologies
- Webinars on Hot Topics
- Analyst Access

O2 & TAG

- Strategic Support
- Commercialization Support
- Acquisitions Pipeline Support
- Investment Due Diligence
- Business Development
- Custom Research
- Market Intelligence

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BlueTech Research Offerings

Insight Reports

Company Reports

Webinars

BluePrints

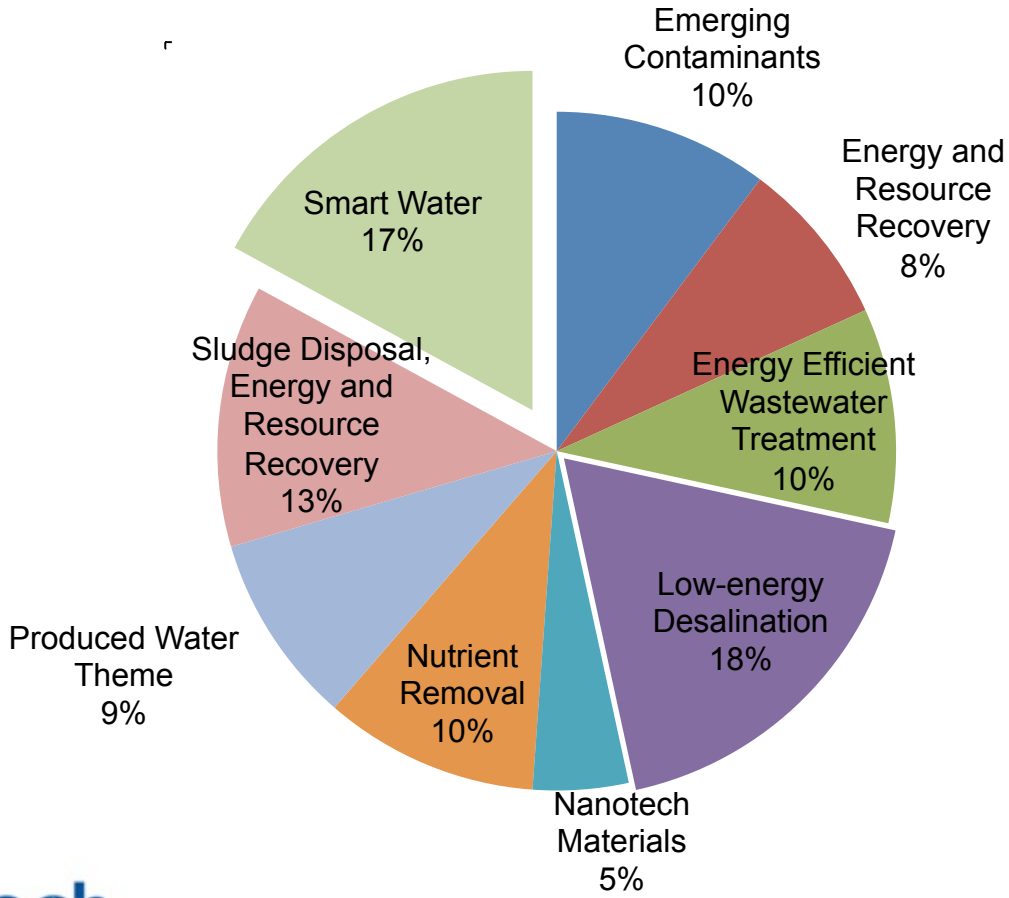
Company Tracker

Licensing Tracker

Intelligence Briefings

Patent Tracker

Disrupt-o-meter®



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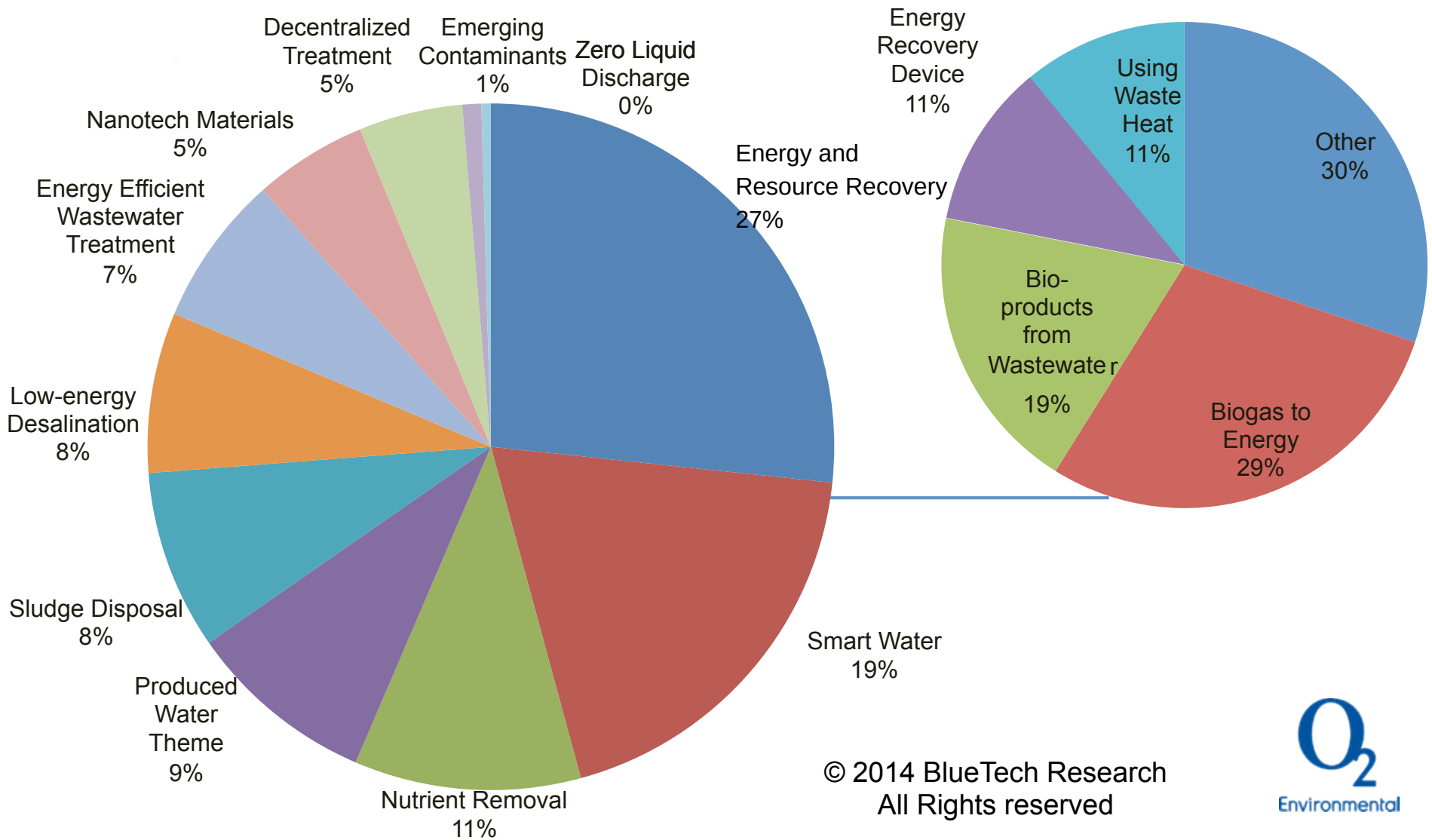
Investment Themes

Please consult author for complete description.



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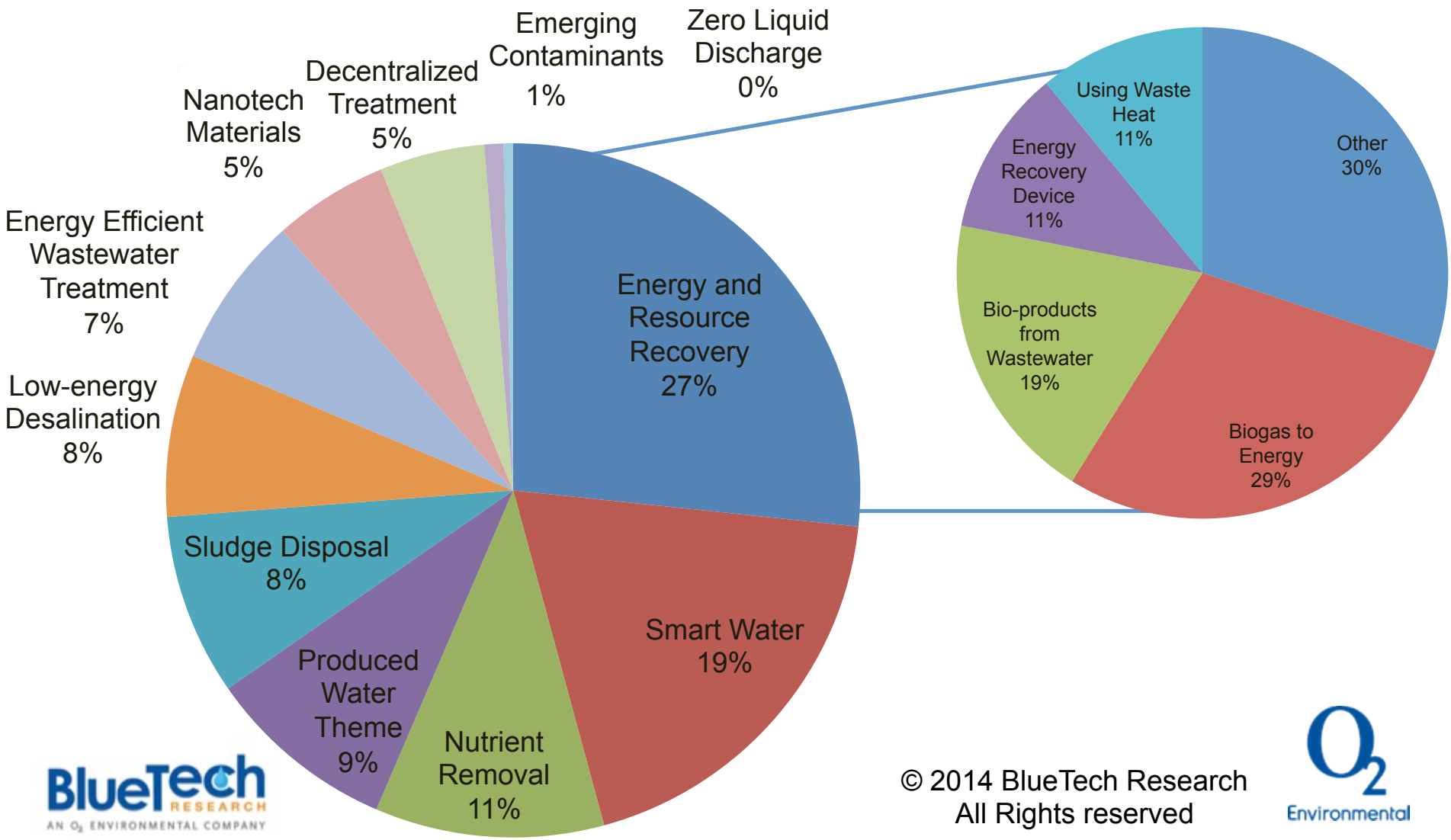
Investment in Water Technology by Themes

Please consult author for complete description.



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Overall Objectives of Technology Verification

- Accelerate Adoption of Solutions which Meets a clients need: Win-Win
  - Empower Decision making
  - Increase buyer confidence
  - Reduce Risk

A compelling value proposition

- *Innovation Should Deliver its own value*

- *The raison d'etre of the water industry, is not to deliver double digit returns to investors!*

- *Innovation is only innovation… if it meets a customers needs*

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MBR - An overnight success story… *after 20 years!…*

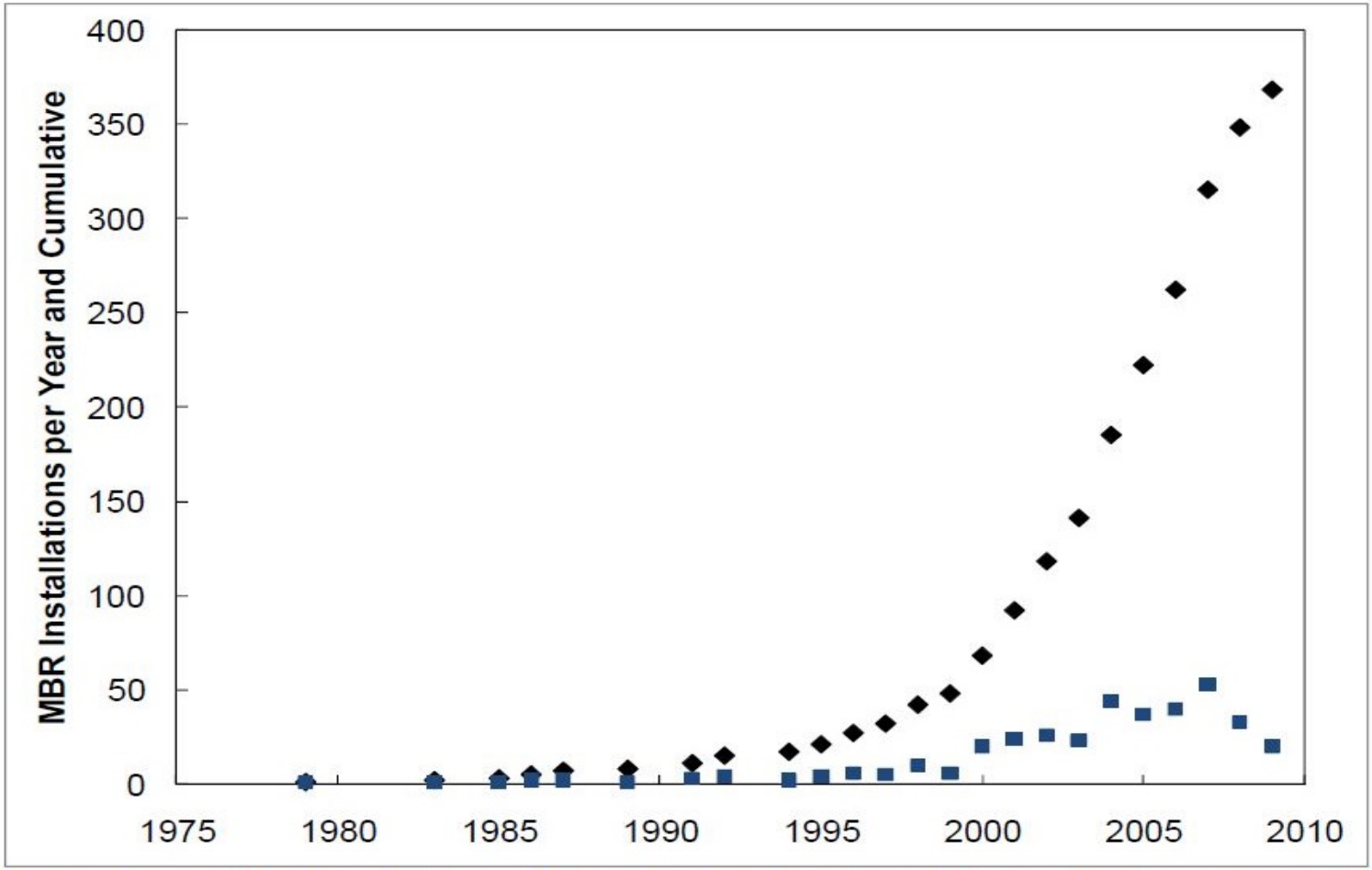
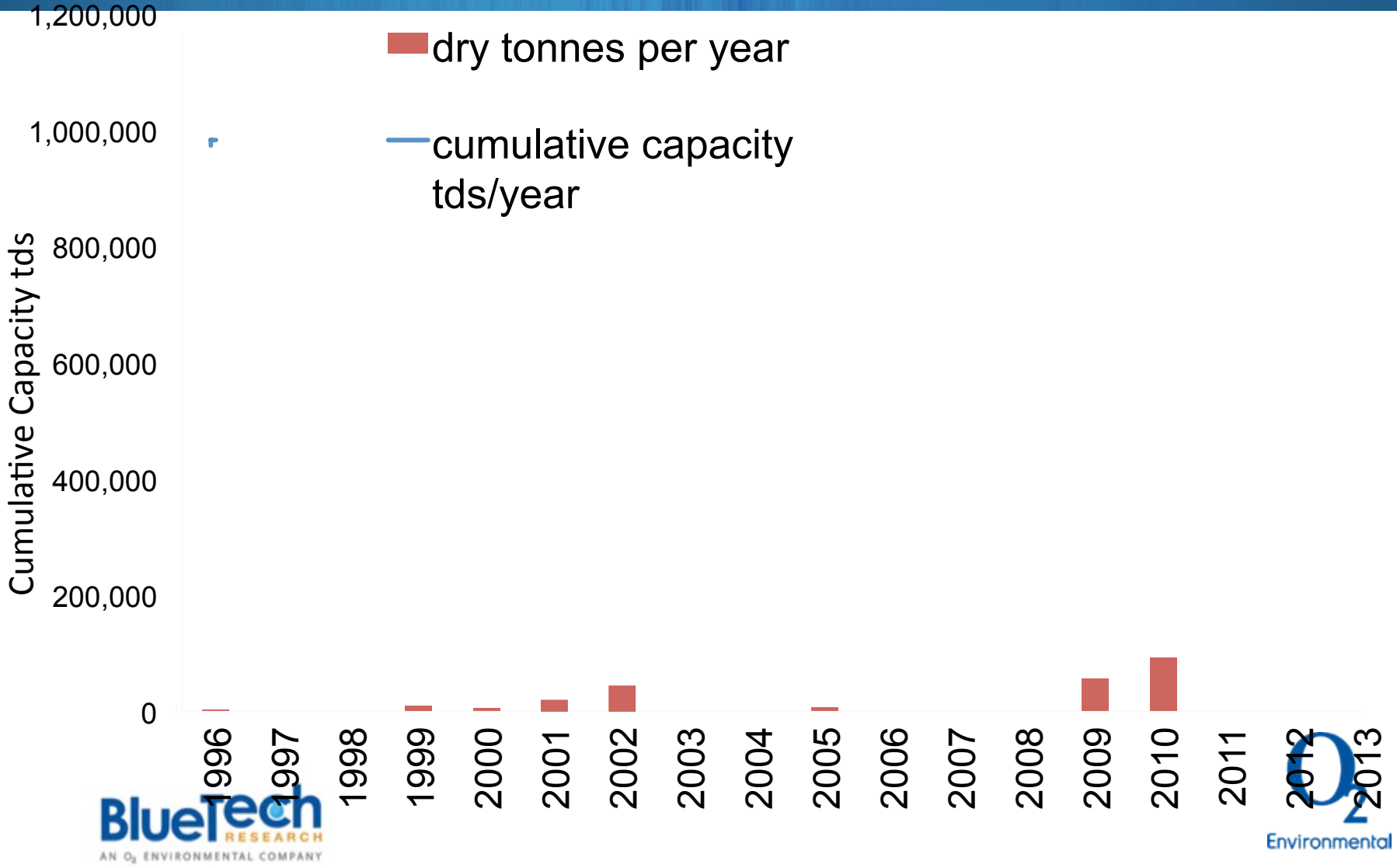


Figure 13. S curve for numbers of North American MBR plants put into service by Zenon. Blue squares show installations per year, while black diamonds show cumulative installations.

Cambi S curve
- Another overnight success story
….. *after 20 years?*



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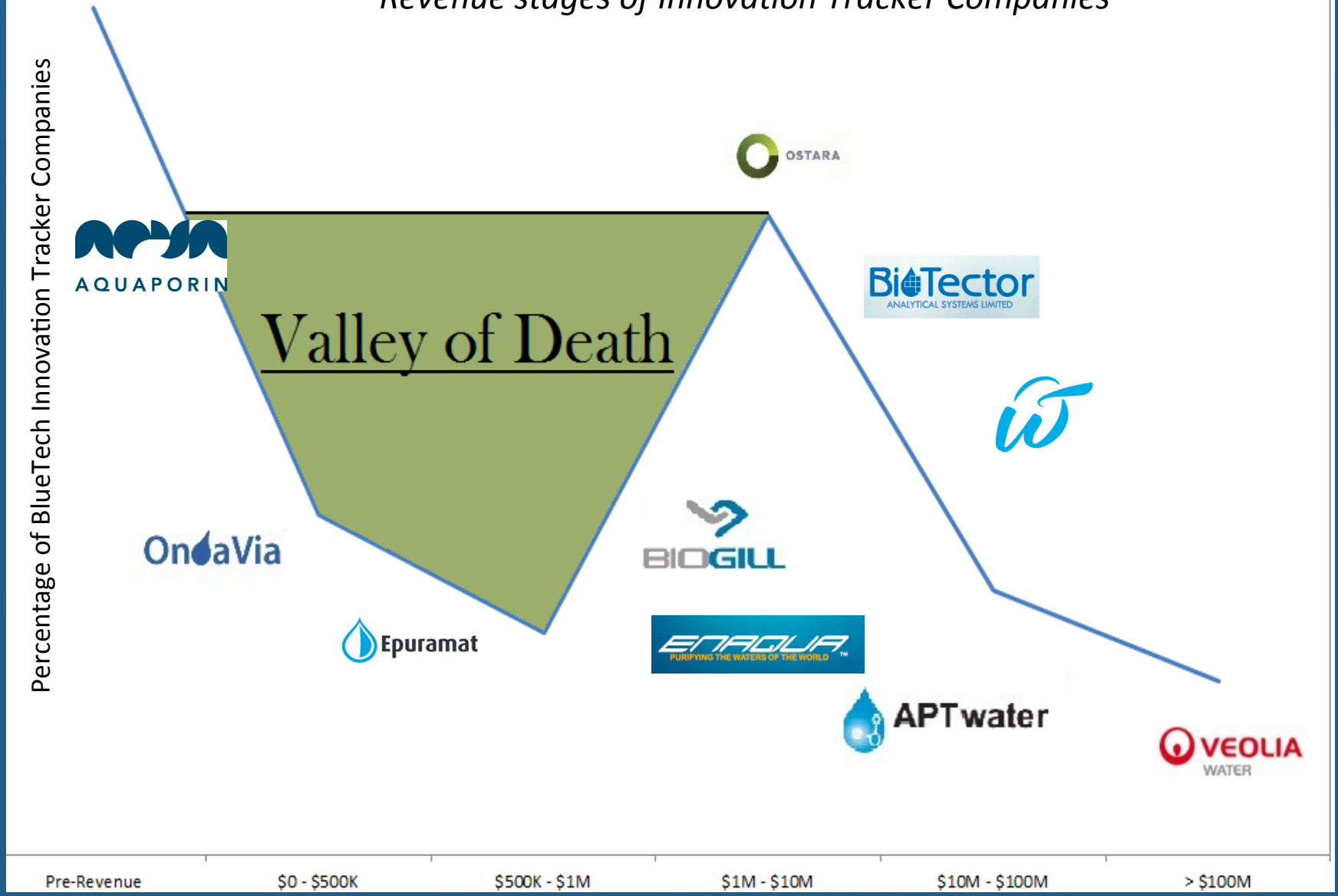
Water Technology Innovation Food Chain
–*Revenue stages of Innovation Tracker Companies*



Company Revenue Bracket

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Avoid death by Pilotitis

- Many companies die the Valley of Death from Pilotitis
- Successful piloting
  - Need to gather the right data
  - Test on the right waste stream / feedstock
  - Independent third party validation
  - Link piloting to next steps in commercial process

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Keys to Successful Demonstration

- Best use of Seed funding is to fund a demonstration facility
- Needs to be at, or close to, full-scale
- Ideally with a Flag Ship client within 50km of your Head Office

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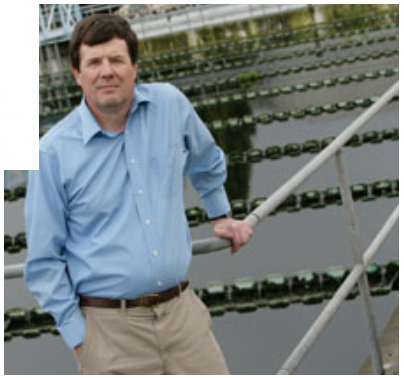
Key Ingredients

- The Early Adopter – a rare species
- Exhibit A: Rob Baur, Clean Water Services



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Our Experience

- No two sites are the exactly the same
  - So verification is good, but performance is highly dependent on test conditions
- What do we look for when vetting a technlogy:
  - Does it defy the laws of Thermodynamics?
  - Has it been proven, at what scale, under what conditions.
  - Review available data

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Observations on Technology Verification

- Fragmentation plays out in testing and validation, just as it does across the entire water industry, as a result of:
  - Different technologies
  - Different Applications
  - Different Scale
  - Different clients

Ideas to facilitate buyer confidence

- Peer to Peer
  - WEF Discussions Forums – are great!
  - Conference Papers – great resource, often underutilized.
  - Crowd sourcing & Social media?

Other Approaches

- ETV in Europe
  - 10 Accredited bodies
  - 3 Areas covered: Water, Waste, Energy
- SDTC in Canada
  - Very successful demonstration support initiative www.sdtc.ca

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SPARE SLIDES

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Licensing Opportunities

Lignin Based Ion Exchangers

Research Institute: Lawrence Livermore Natonal Laboratory
Technology Offering: Lignin polymer material combined with ion exchange and chelate functional groups.
Technology Concept: Ion exchange sorbent formed from lignin. Lignin is lower cost and poses a lower environmental risk than conventional functionalized polymers. The sorbents can be functionalized to remove target contaminants and have been successfully demonstrated for the removal of rhenium, gold, platinum and a range of organic compounds.
Uniqueness/Novelty: ●●○
Unmet Need in the Market: ●○○
Size of Market Opportunity: ●○○
Website: https://ipo.llnl.gov
Application: Industrial Wastewater Treatment, Environmental Remediation
Country: USA
Contact: Annemarie Meike (Business Development Executive)
Email: meike1@llnl.gov
Telephone:+1.925.422.6416

Purification Reactor

Research Institute: Innovate Calgary
Technology Offering: Two-Stage Purification Reactor for Large Scale Wastewater
Technology Concept: Photocatalysis of wastewater. Organics are adsorbed on the surface of a solid catalyst. UV is applied which leads to organic matter destruction through advanced oxidation and microbiological deactivation
Uniqueness/Novelty: ●○○
Unmet Need in the Market: ●○○
Size of Market Opportunity: ●●○
Website: www.innovatecalgary.com
Theme: Wastewater Treatment
Application: Municipal, Industrial Water Treatment
Country: Canada
Contact: Heather Phillips
Email: hphillips@innovatecalgary.com
Telephone: +1.403.270.2435

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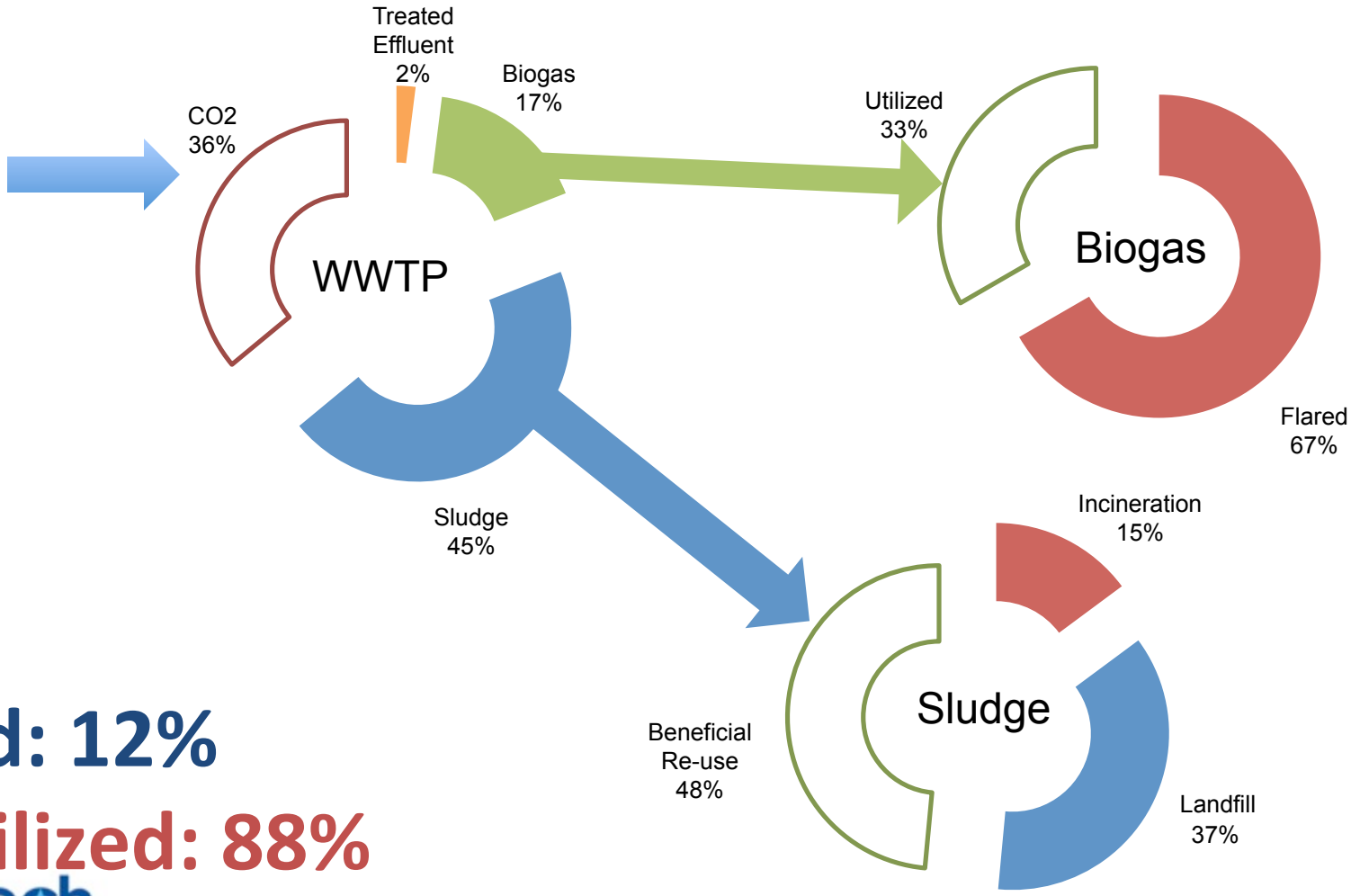
Total USA Municipal WWT Wastewater Energy Input

49 Million MWhr/yr in USA Municipal Wastewater



Utilized: 12%

Not Utilized: 88%

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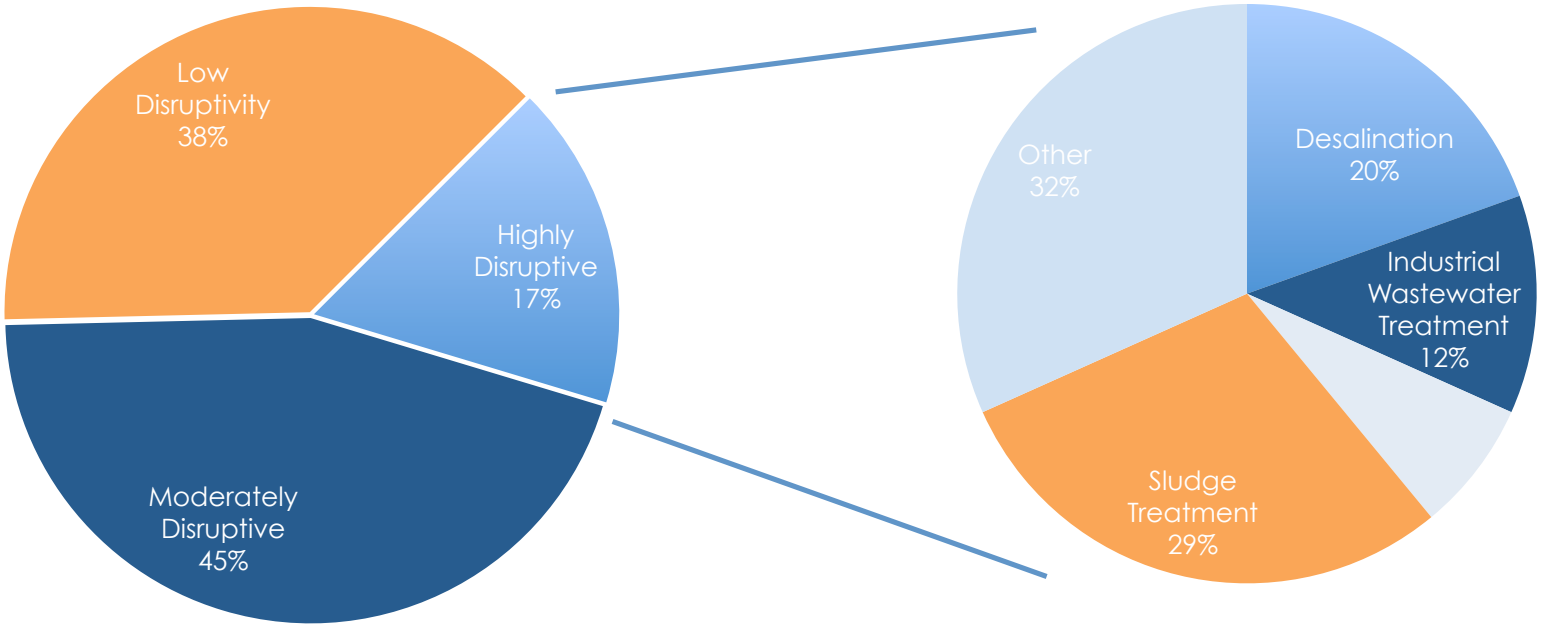
Source: BlueTech Research Insight Report

Disruptive Water Technologies
- mapped by Application Area



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