

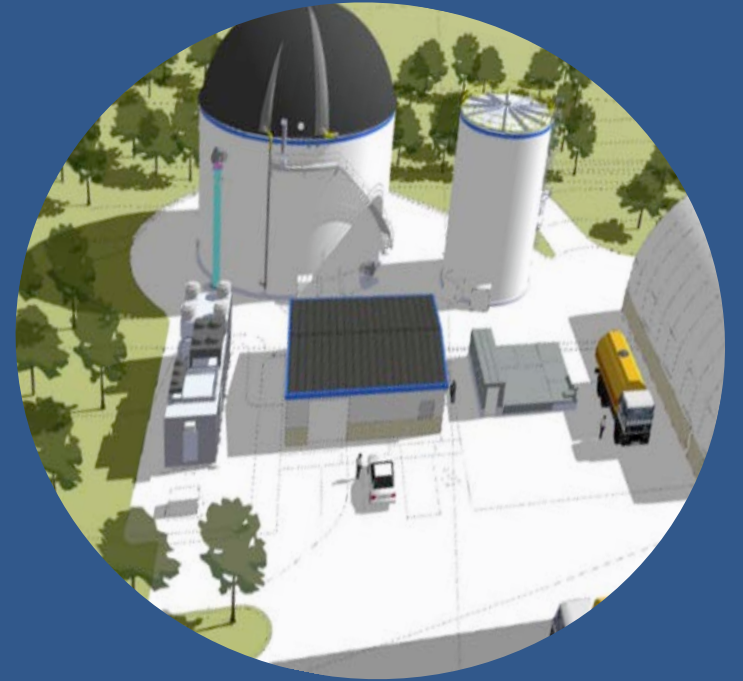


Anaerobic Digestion of Food Waste Project

NEWEA/NYWEA Spring Meeting

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The Supreme Group



Time's Are Changing



Waste Management



Material Recovery

CT Manages 2.3 M tons of MSW yearly

22% of our MSW is food waste

**Food waste is a (the) leading contributor of landfill
leachate pollution**

500,000 TPY Food Waste Recovery Goal



**60% SW
Recovery
mandate**

Food Waste Recycling Mandates are Here

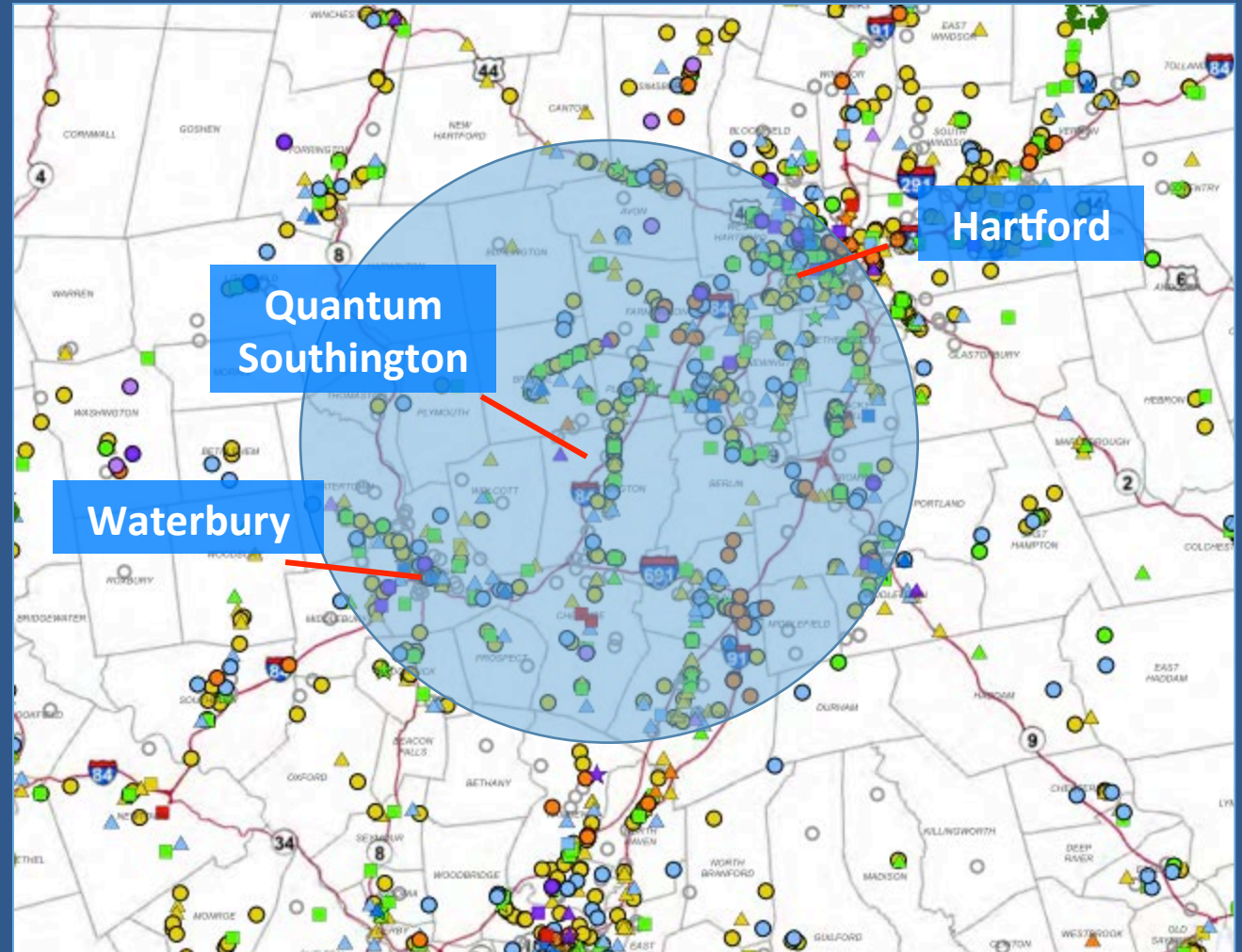
CT & MA have both adopted food recycling mandates that call for separating food out of the waste stream for recycling

Connecticut:

- 104 tons/year, 2 tons/week
- Separate organics out of the garbage
- Gets more aggressive in 2018, 52 tons/year

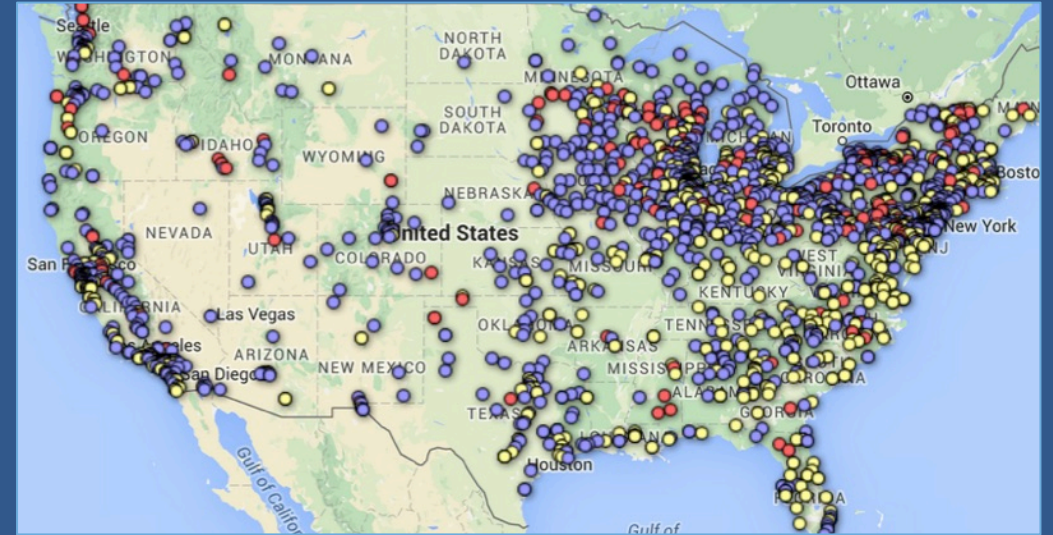
Massachusetts:

- 52 tons/year, 1 tons/week
- Separate organics out of the garbage
- MA EPA hiring “enforcement agents”



Digesters in the United States

- Digestion is widely used across the world as a recycling technology.
- 2,000 digester installations in the United States and growing rapidly.
- 7,000 digester installations in Germany and growing



Digesters Installed in the U.S.



Orlando, FL



San Jose, CA



Sacramento, CA

Digesters- Quantum BioPower – 2016 Planning



Quantum Biopower is developing a 40,000 ton per year, 1.2 MW Digester –
CoGen facility in Southington CT - Online 4Q2016
Plans to initiate new 3-5 projects in 2016

Primary Operations of the Digester Project



Decontamination/Depackaging – Contaminant Removal - Pulp & emulsify food waste (8-12% solid)

Digestion/Biogas Creation - 2-stage digester, biogas collection sphere

Primary Operations of the Digester Project



Biogas Conditioning & Combined Heat and Power - Drying & H₂S removal & energy creation

Wastewater Treatment - Nutrient Recovery & Removal – digestate holding w biogas collection sphere

Food Waste!

Pre/Post Consumer



Packaged Waste

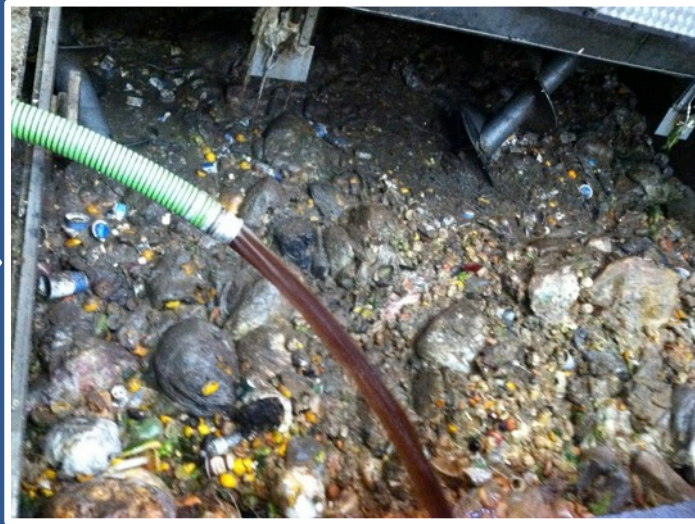


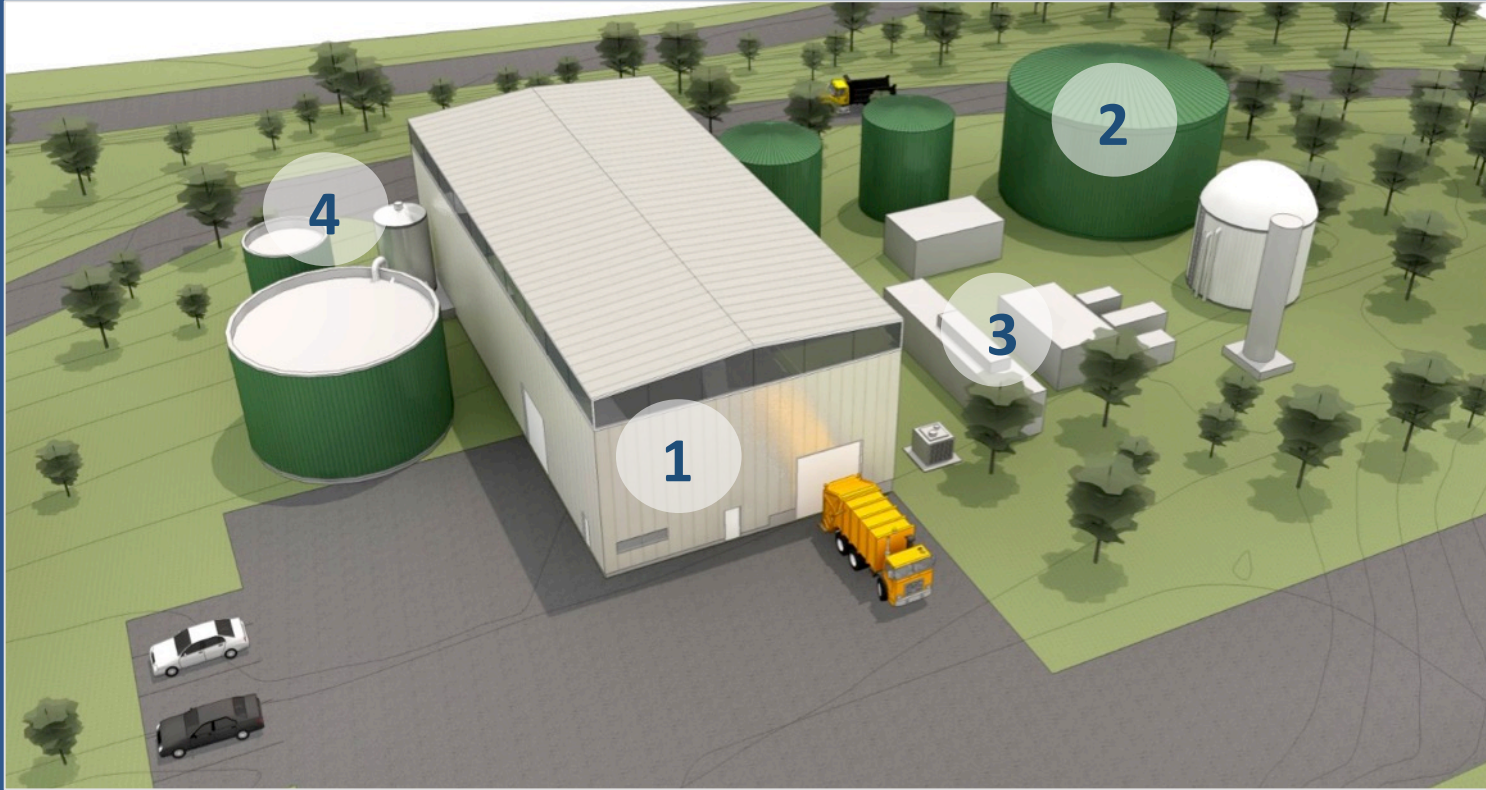
Fats/Oils/Greases

Dairy/Beverage

Food Processor Waste

Our Facility in Photos





1. Food Waste Processing

- 40,000 Tons/Year
- Fats/Oils/Greases
- Meats
- Produce
- Packaged products
- Bakery Items

2. Methane Production

- Natural process
- Heat and Mixing
- Methane created

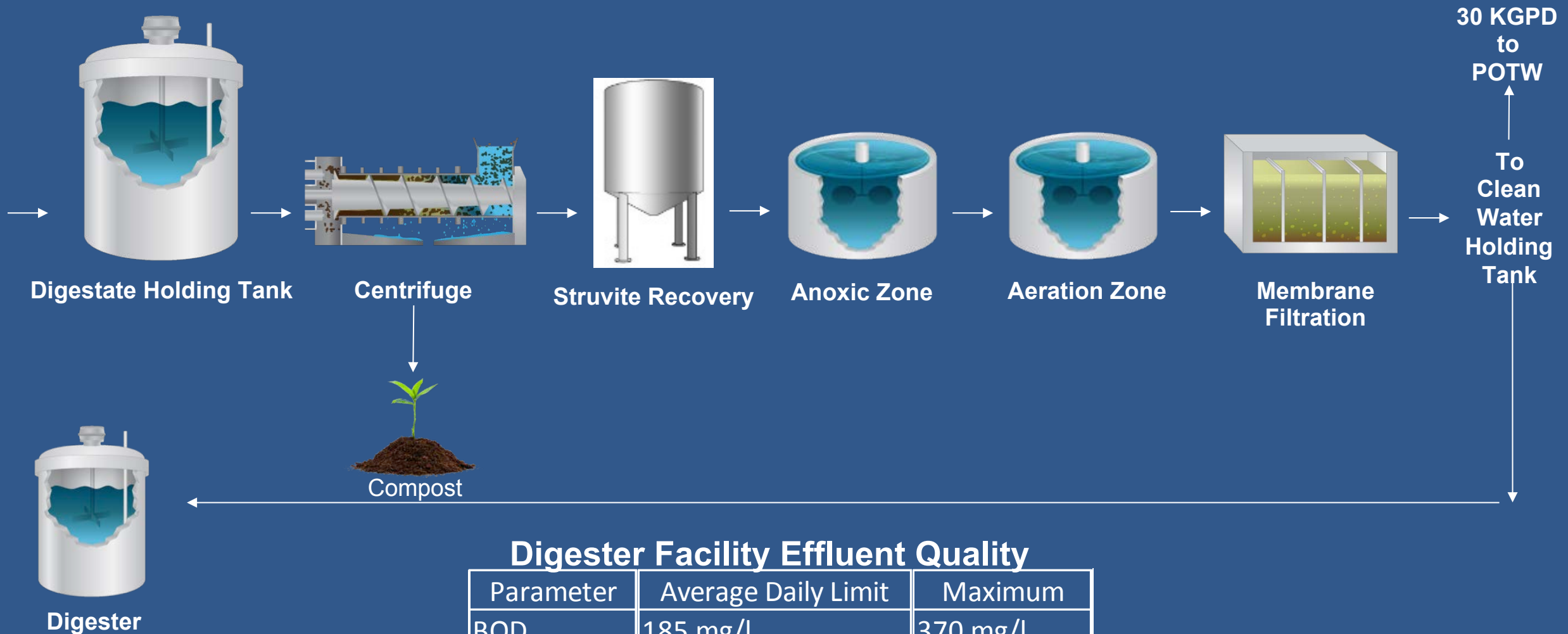
3. Sustainable Energy

- 1.2 MW of electricity
- 1 MM BTU's of heat
- Southington, CT

4. Compost

- 10,000 tons/year
- Organic compost
- Farms & Growers in CT

Wastewater Treatment – Nutrient Recovery



Digester Facility Effluent Quality

Parameter	Average Daily Limit	Maximum
BOD	185 mg/l	370 mg/l
TSS	185 mg/l	370 mg/l
Nitrogen	50 mg/l	50 mg/l
Phosphorus	5 mg/l	10 mg/l

Wastewater Treatment

WWTF

- *BNR Package Plant*
- *Oxic-Anoxic Zones*
- *P-Recovery Struvite System*
- *N-Removal*
- *Membrane Filtration as Polishing Step*

The Wish List

Water Re-Use

- Food Waste Digestion classified as an Industrial Process
- Treated / Classified as an SIU (Significant Industrial User) by CTDEEP.
- Precludes beneficial re-use of water without extensive O&M restrictions.
- N&P in wastewater have value – Expensive to remove.
- At Southington Site – have an ideal recycle opportunity (forest product / soil amendment / ship off-site to add to topsoil).
- Other sites ?

Influent:	Effluent:	Removal Efficiency
22,300 mg/l COD	<100 mg/l COD	> 99 %
640 mg/l N	<15 mg/l N	> 97 %
112 mg/l P	<2 mg/l P	> 98 %

The Wish List

Enabling co-digestion at municipal wastewater treatment facilities

- Certain States do not allow for beneficial re-use of co-digested wastewater sludge – other states do.
- Regulatory stance of wanting digester developments such as this – but ??
- Regulatory – driven changes could allow greater flexibility of inputs to system
- Social position of offering a sustainable solution to numerous waste products.

Creation of advanced net-metering energy programs

- Energy distribution from Class 1 producers, to municipalities and partners who divert waste
- Need MWH or MWH/MW - driven (versus MW) incentives for power produced

The Wish List

Participants – Collaborators

- Performance Contract Groups
 - Project Might Fit VERY well into a diverse muni Performance contract
- Large-scale Waste Generators – Haulers who see Opportunity but need a Developer
- SBIR Collaborators re: co-digested gas treatment, fuel cell tri-generation

Energy Thought Leaders

- Regulatory Satisfaction of RPS through NG pipeline intro / creation
- Interconnection Expertise – thoughts to minimize cost and risk

The Wish List

New Sites

- *3-5 New Projects to be initiated in 2016*
- *Population centers*
- *Grid Tie-In Complications (Muni Utilities advantage)*
 - *WWTF Co-Location allowing 'Behind the Meter'*
- *One Stop Shopping – need buy in at Exec Town management level at onset.*

Thank You

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