

NH'S UNIQUE APPROACH TO WASTEWATER ENERGY EFFICIENCY



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EVERSOURCE

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*Working Together to Reduce Energy Use, Protect the Environment,
and Save Money*

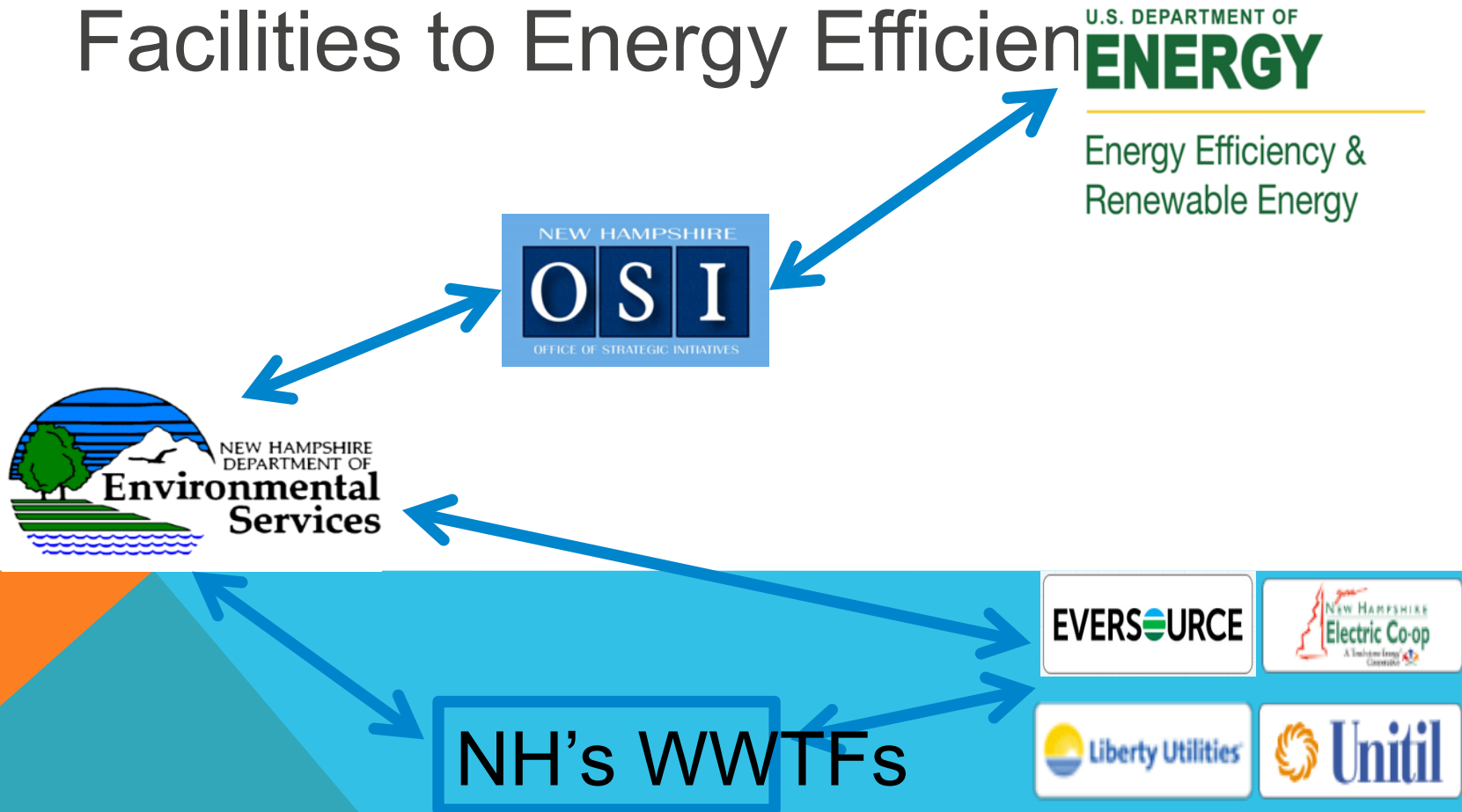
IT ALL STARTED WITH A EDUCAT



Made the Snow
at Mass Lane 11

That education led to:

Leading NH's Wastewater Treatment Facilities to Energy Efficiency



Project: Leading NH's WWTFs to Energy Efficiency

GOALS:

Benchmark 72 WWTFs

35 communities and
4 workshops

Up to 26 WWTFs

33% Savings with
10-year payback

Encourage through
education and
outreach



STATUS:

67 WWTFs benchmarked

45 communities and 80+
attendees at 5 workshops

16 completed

8 partially completed

32 WWTFs and 9 DWFs

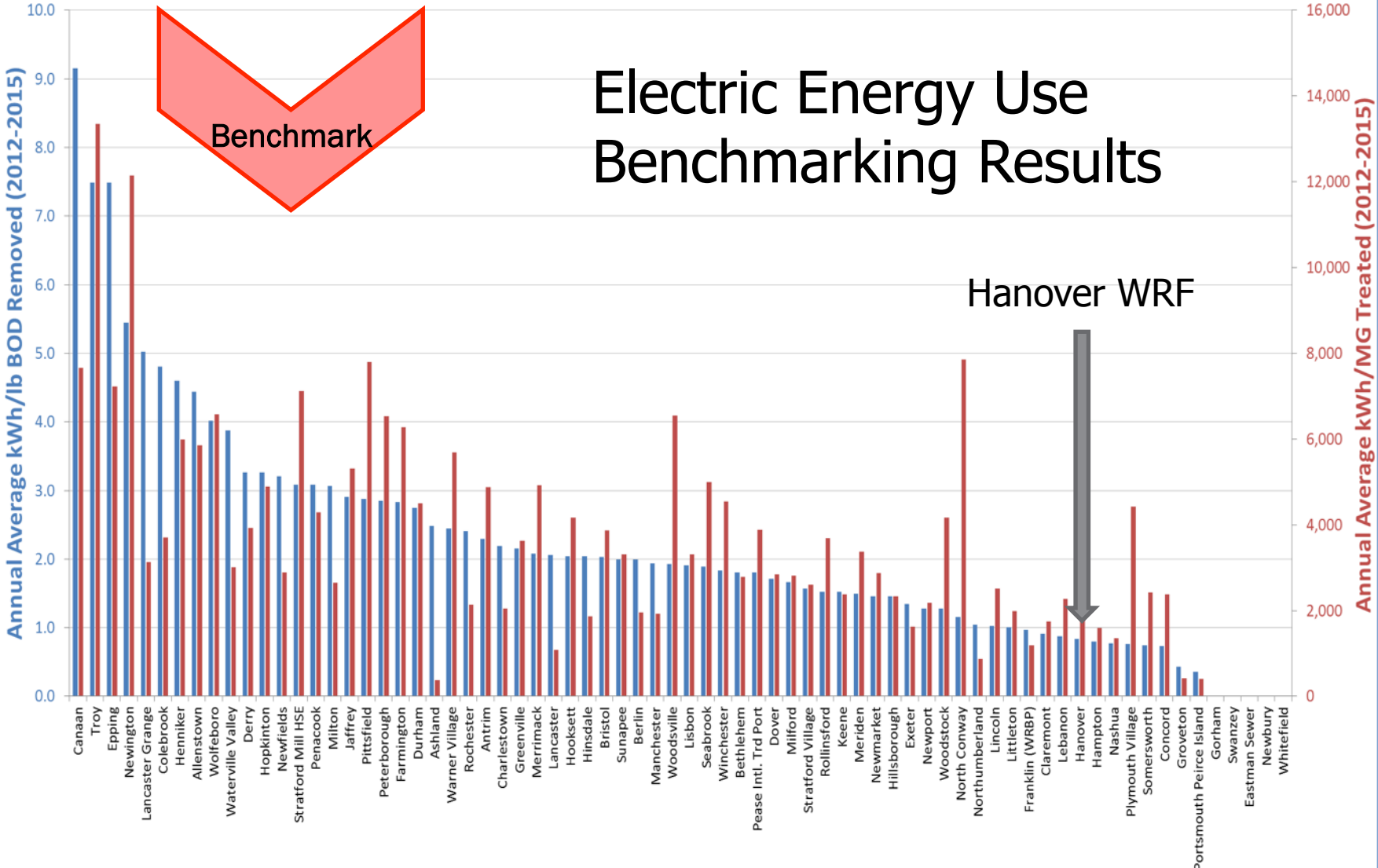
20-47% savings

Avg 33% for first 16

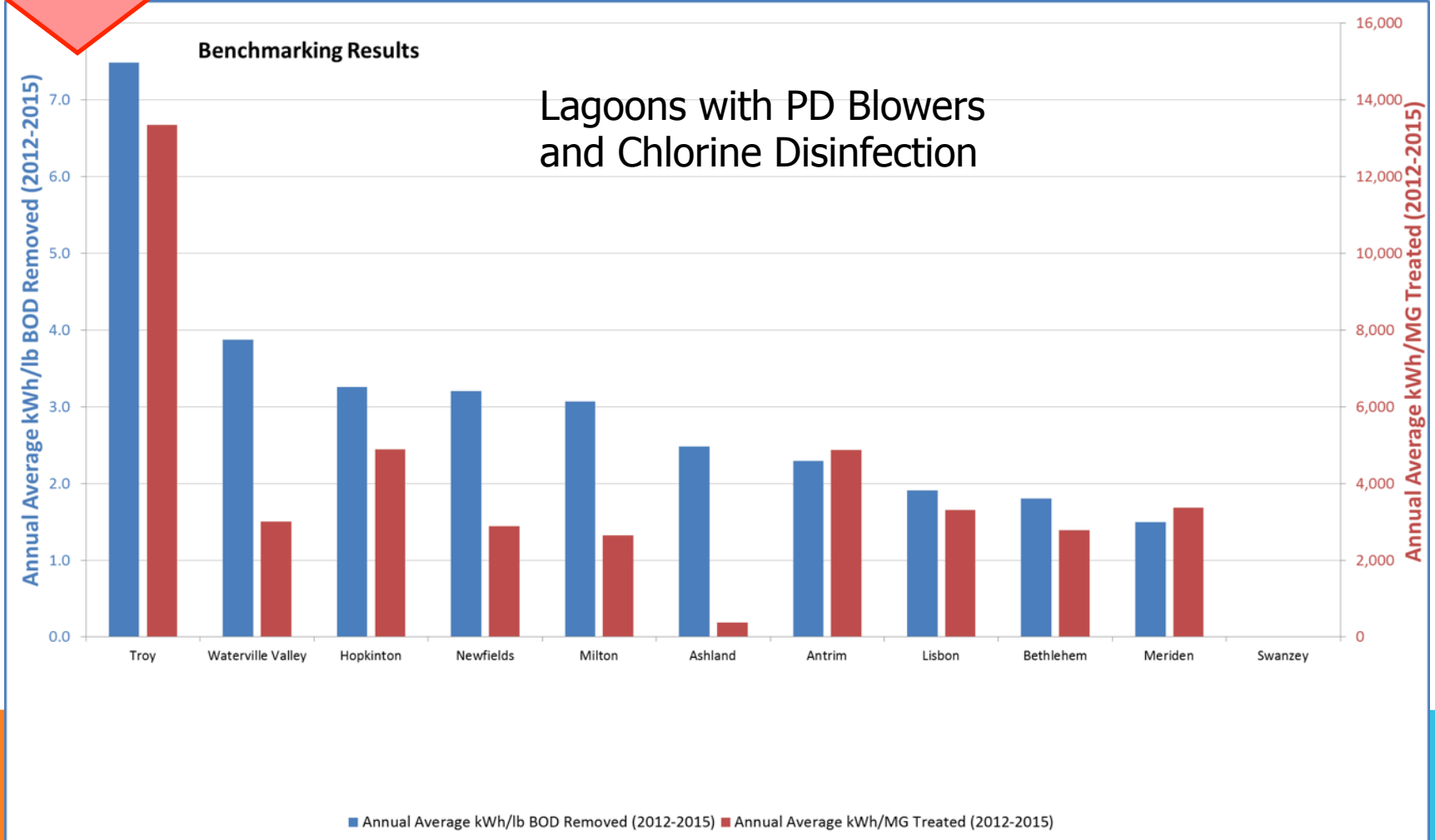
Avg 2.6-year payback

In progress/on-going

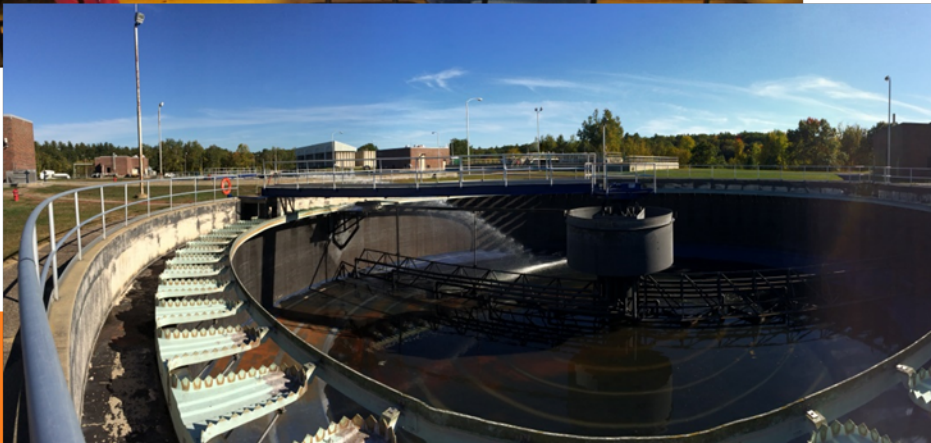
Electric Energy Use Benchmarking Results



Benchmark

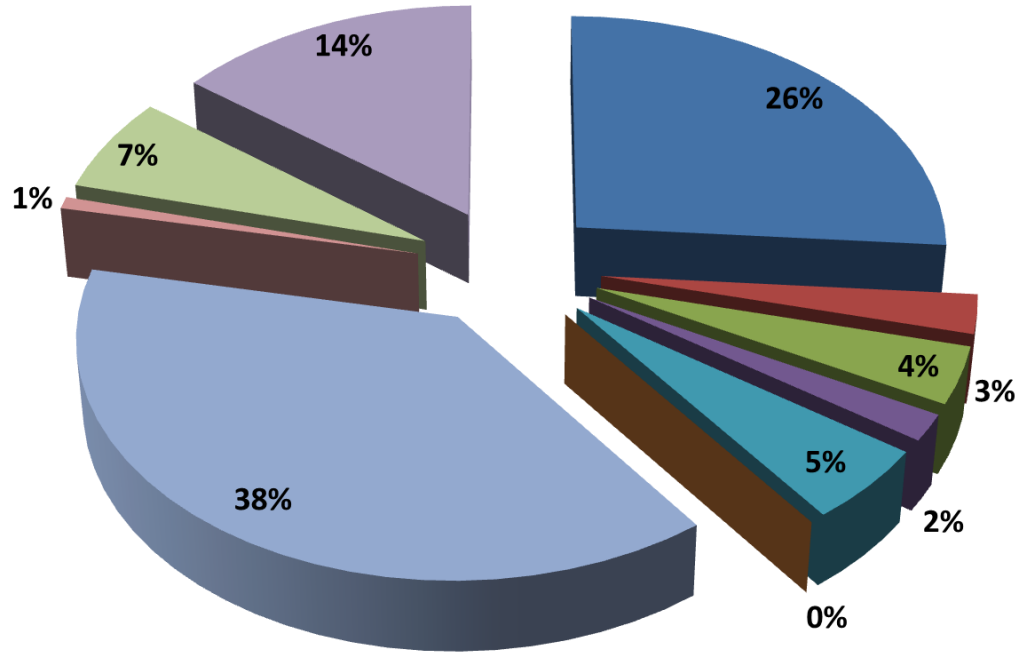


Benchmark
Education



Audits

2016 Hanover Energy Audit Conventional AS Plant

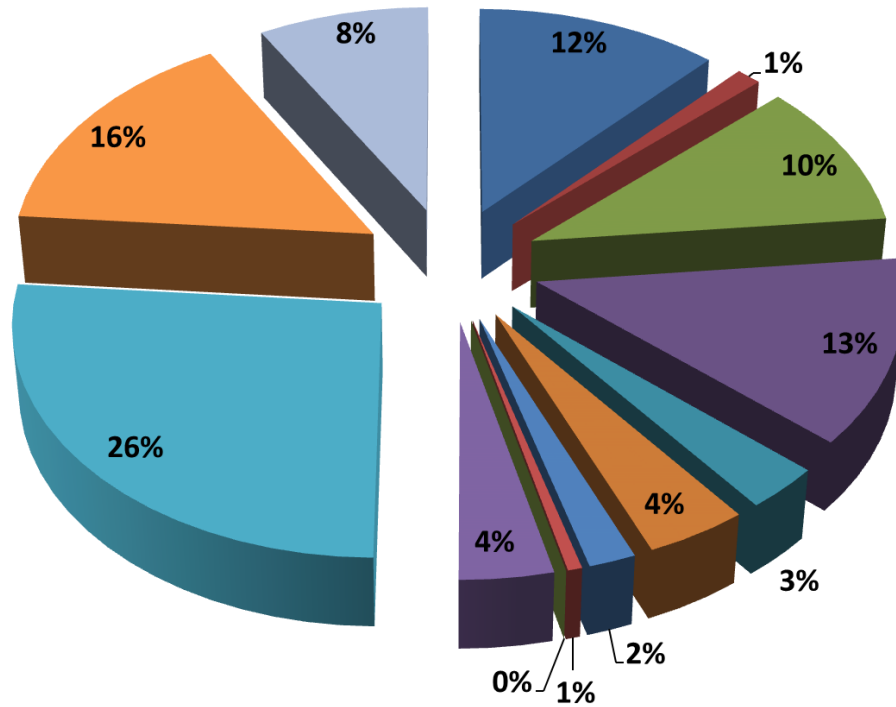


- Building Systems
- Disinfection
- Misc Process
- Primary Treatment
- Secondary Clarifiers/RAS Pumps
- Septage
- Aeration Blowers
- Preliminary Treatment
- Anoxic Mixers
- Sludge Digesters and Dewatering

Audits

2017 Concord Energy Audit

Conventional AS Plant



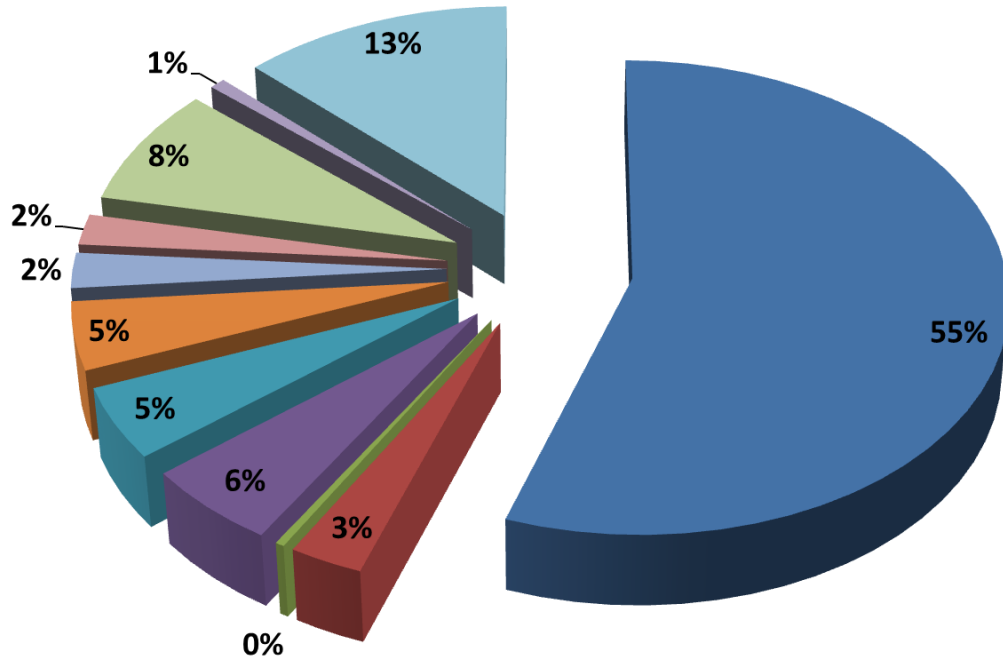
- Building Systems
- Disinfection
- Influent Pumps
- Odor Control
- Plant Water
- Prelim Treatment
- Primary Treatment
- Secondary Clarifiers/RAS Pumps
- Septage
- Sludge Dewatering
- Intermediate Pumps
- Aeration Blowers
- Sludge Holding/Thickening

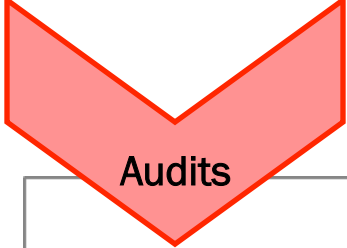
Audits

2012 Lebanon Energy Audit

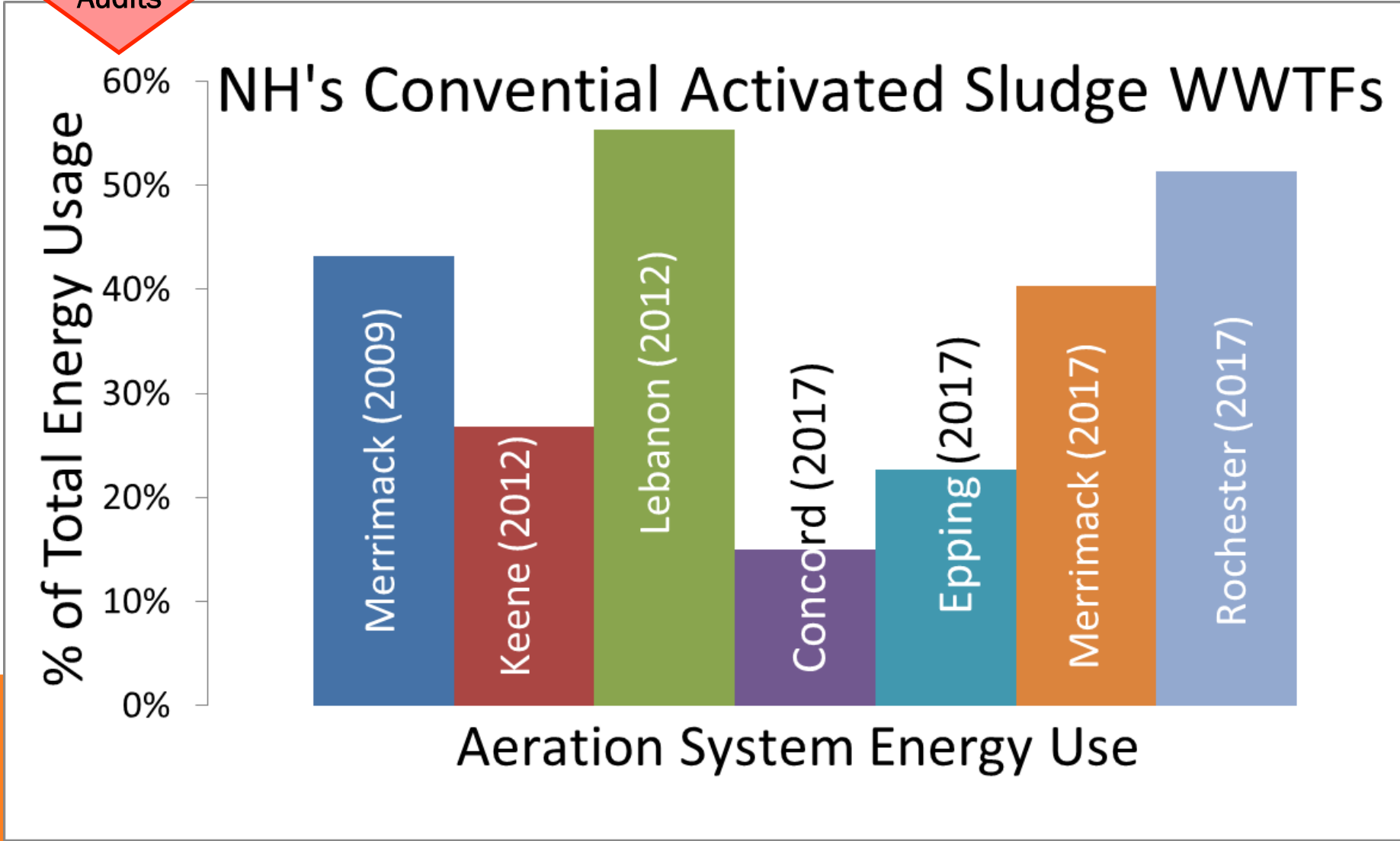
Conventional AS Plant

- Aeration System
- Building Systems
- Disinfection
- Influent Pumps
- Odor Control
- Plant Water
- Prelim Treatment
- Primary Treatment
- Secondary Clarifiers/RAS Pumps
- Septage
- Sludge Process



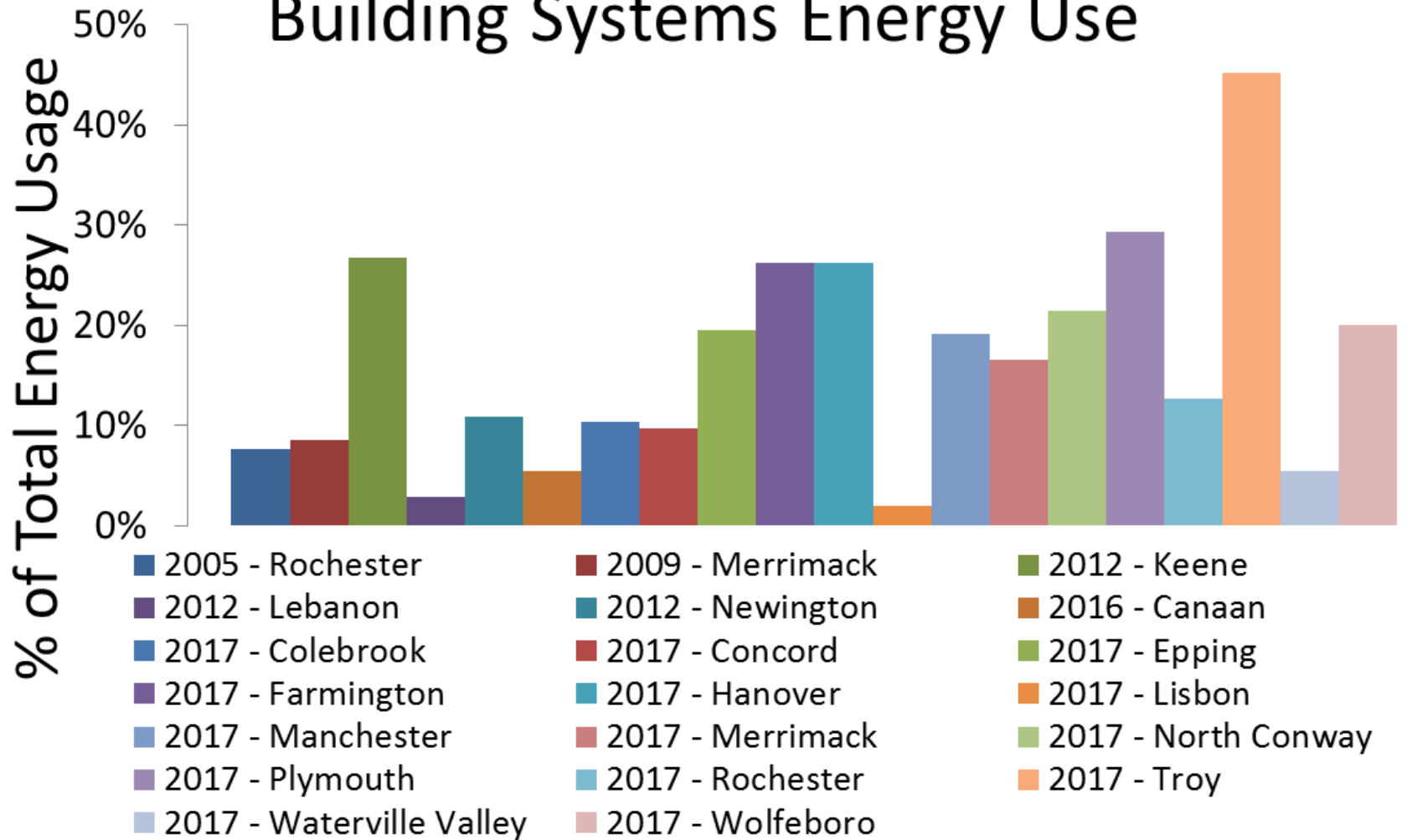


Audits



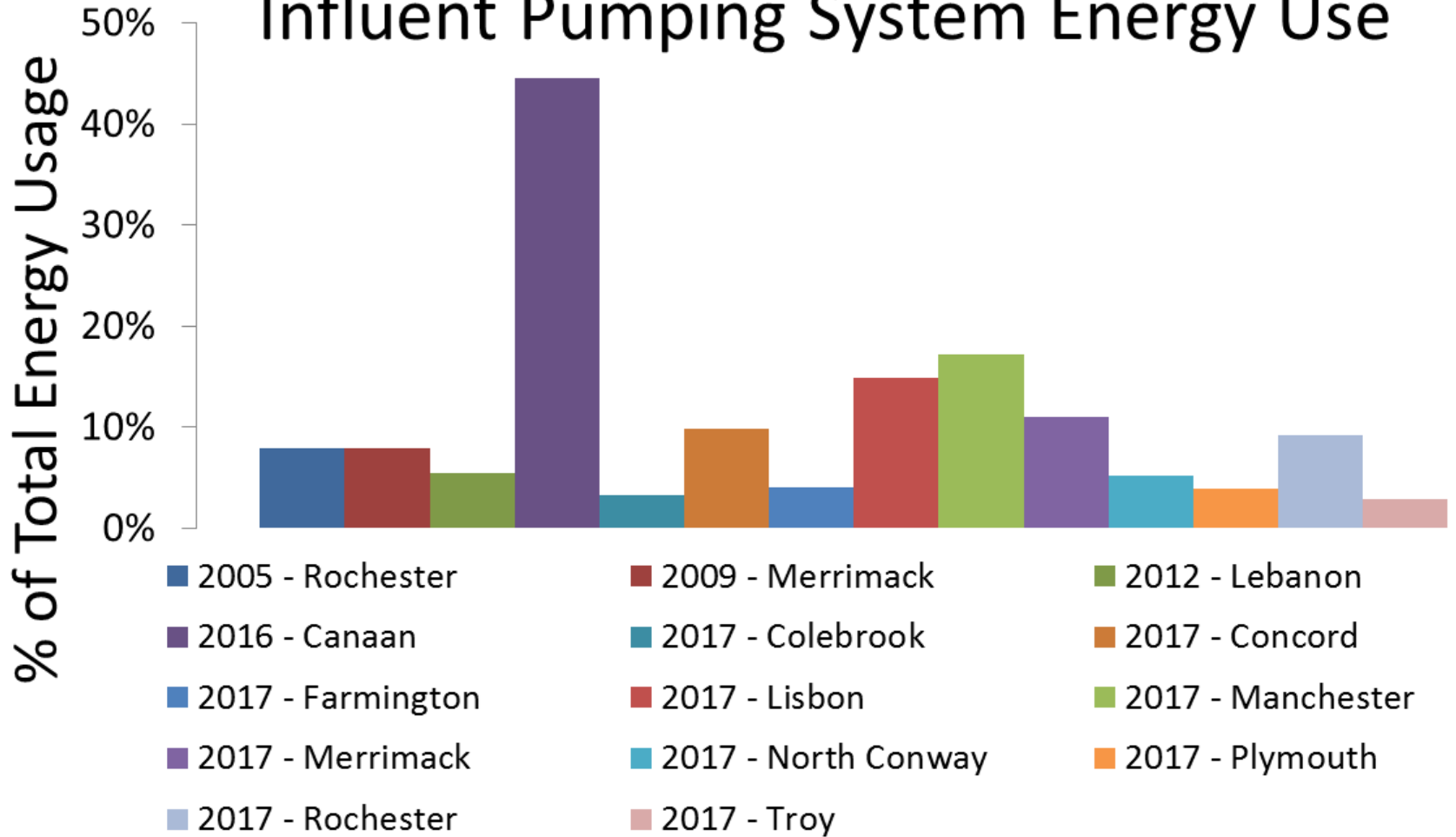
Audits

Building Systems Energy Use

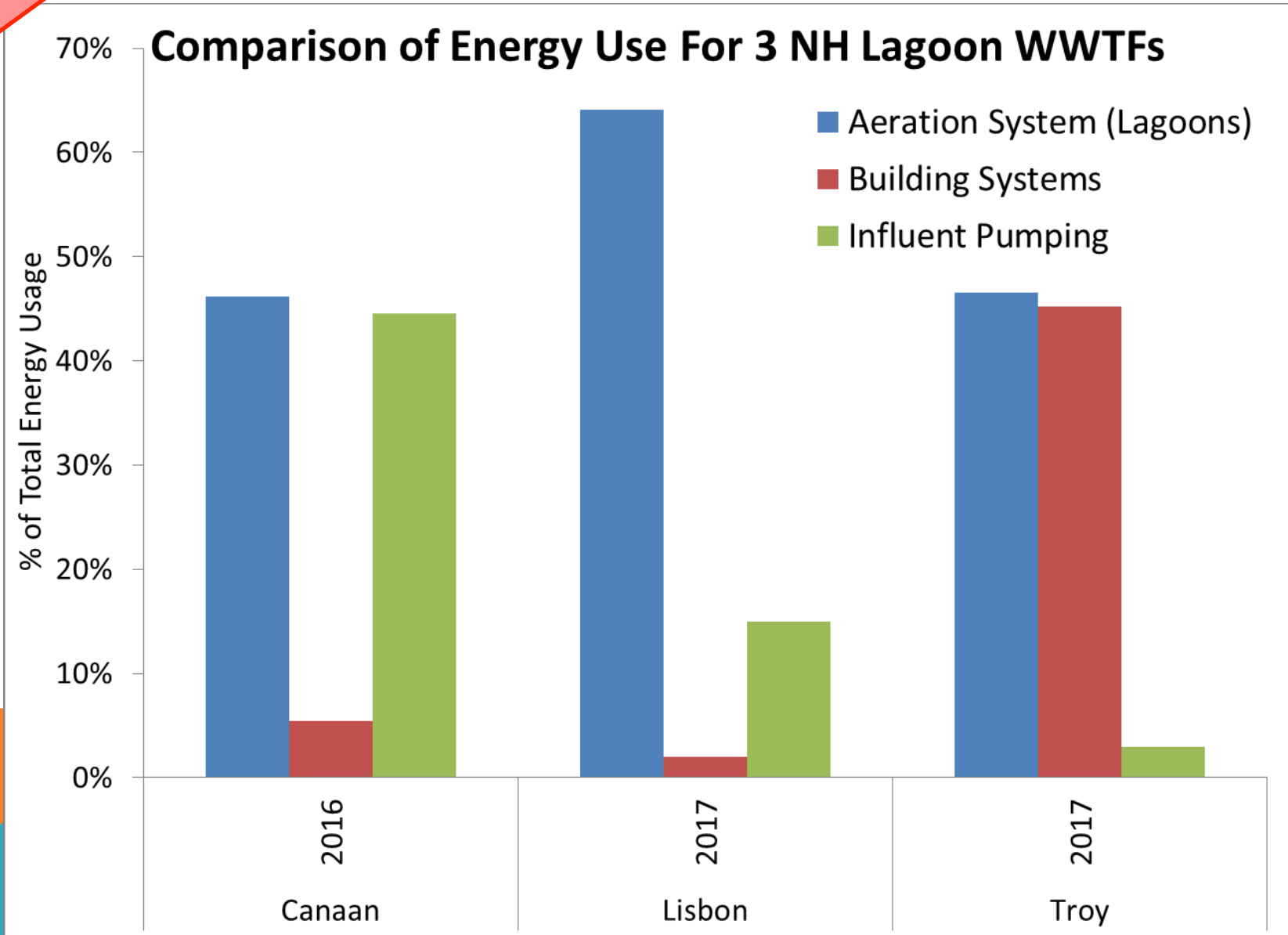


Audits

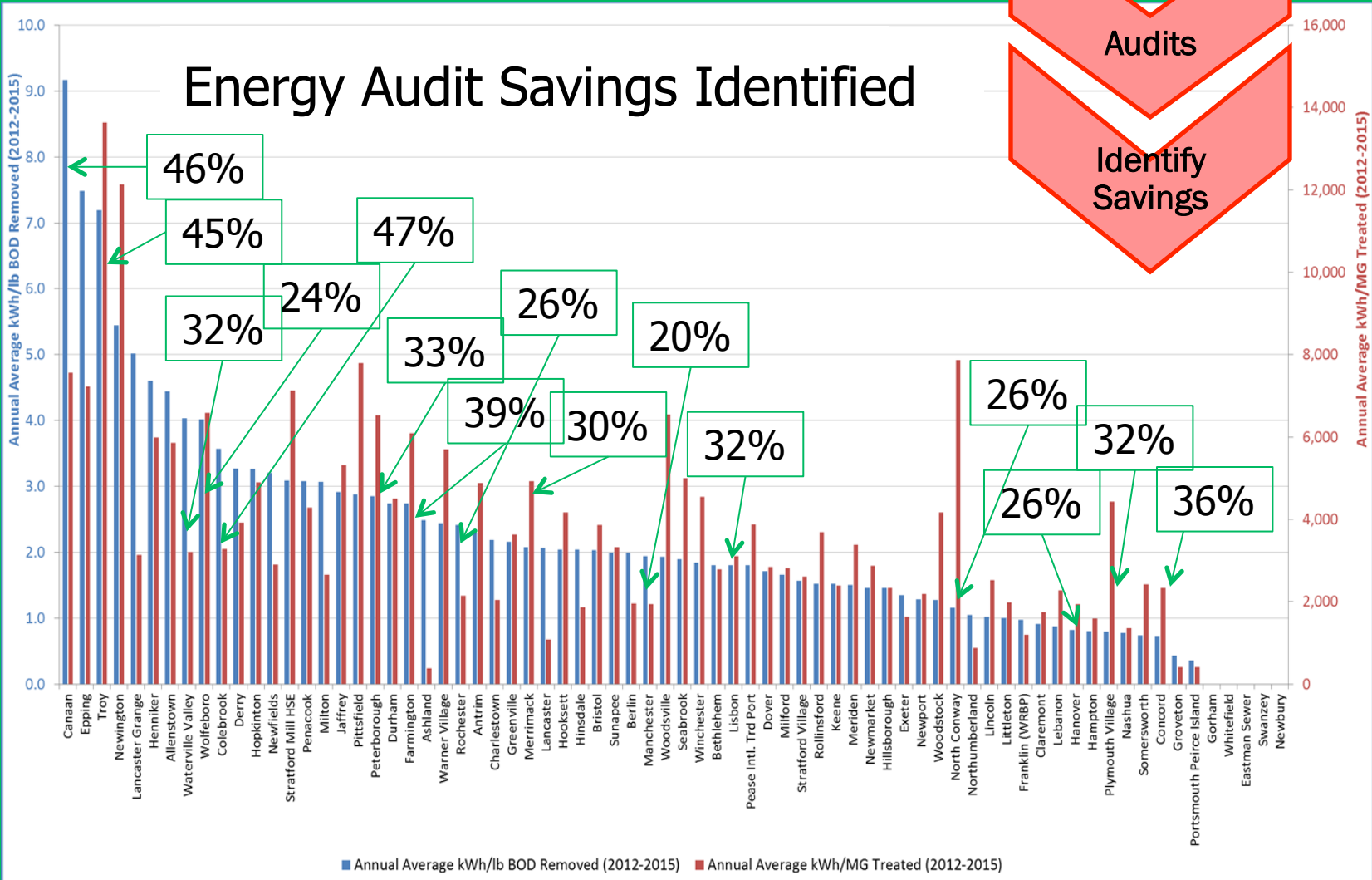
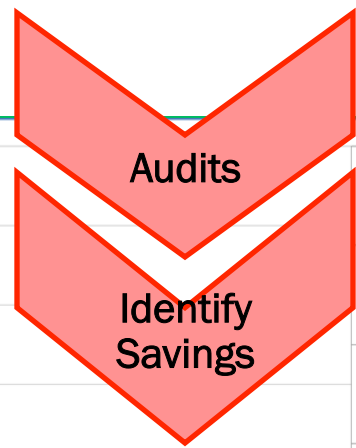
Influent Pumping System Energy Use



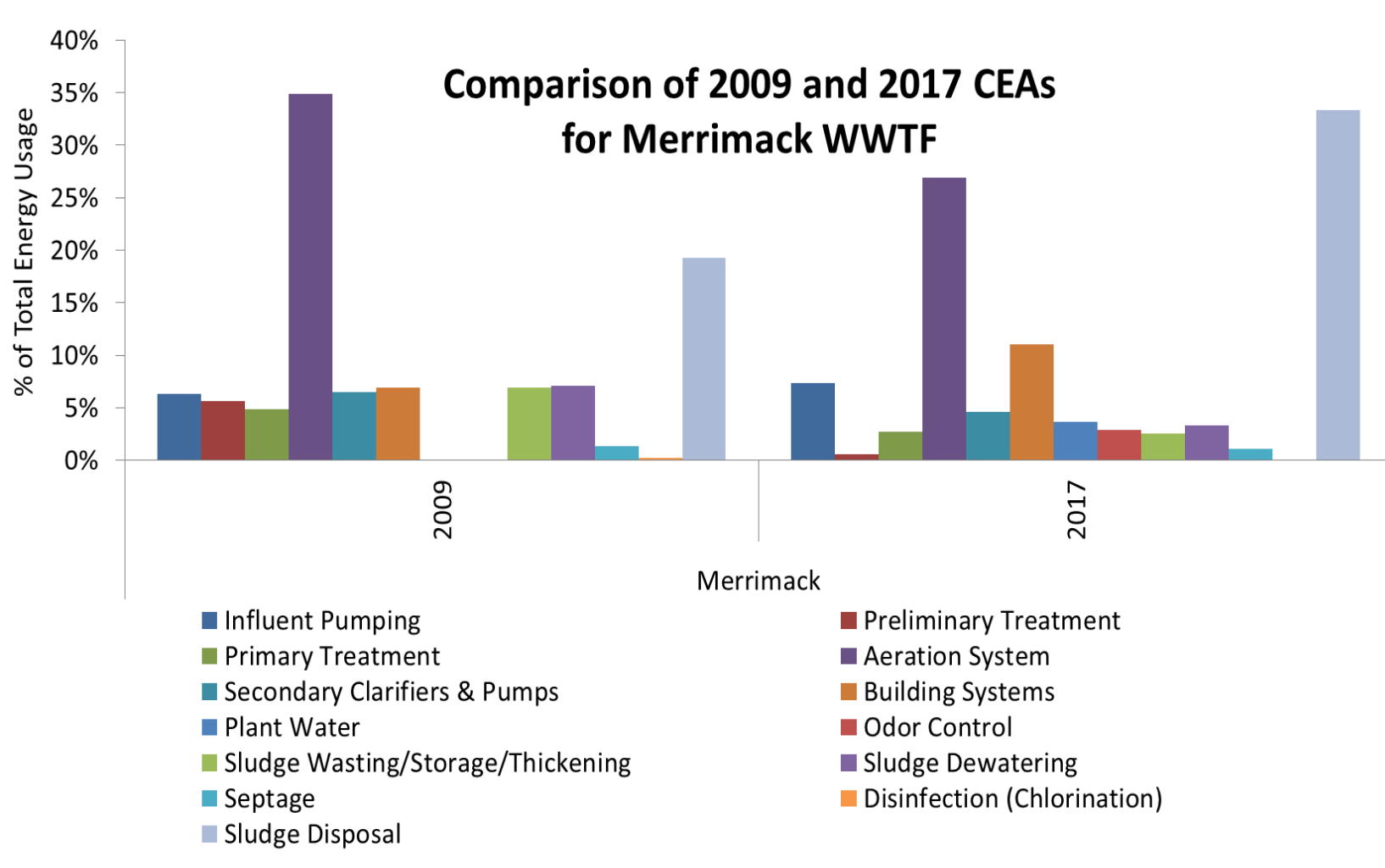
Audits



Energy Audit Savings Identified



■ Annual Average kWh/lb BOD Removed (2012-2015) ■ Annual Average kWh/MG Treated (2012-2015)



NH Utilities



Audits

Funding Sources



- **18** Audits - USDOE Grant
- **6** Audits - NH Utilities
- **8** Audits - CWSRF Principal Forgiveness

32 Comprehensive Energy Audits funded
at a cost of \$325,440

16 Completed so far



Audits

Identify
Savings

AUDIT FINDINGS

Operational Measures

Energy Conservation Measures


Energy Supply Measures





Identify
Savings


COMMON OPERATIONAL MEASURES IDENTIFIED (TREATMENT EQUIPMENT)

- VFDs – absent or in need of adjustment
 - DO Control – absent or in need of adjustment
 - Optimizing offline equipment operation
 - Shutting off or cycling oversized equipment
 - Blower adjustments
 - Improved VFD and SCADA training
- 



Identify
Savings


COMMON OPERATIONAL MEASURES IDENTIFIED (HVAC/BLOCK HEATERS)

- Insulation
 - Block heaters
 - Electric space heaters
 - Thermostat adjustments/control
 - Ventilation controls
- 



Identify
Savings


COMMON ENERGY CONSERVATION MEASURES IDENTIFIED (PROCESS RELATED)

- VFD installation
 - Fine bubble aeration upgrades
 - DO control system installation
 - Jockey (Pony) blowers and pumps
 - Plant water system optimization
- 



Identify
Savings

COMMON ENERGY SUPPLY MEASURES IDENTIFIED

- Change out electric heaters
 - Alternative energy suppliers
- 



Implement

EEB4RE

WHY EEB4RE?

- **The cheapest energy is the energy not used!**
 - **Energy Efficiency CEAs –**
 - 33% energy savings on average
 - 2.6 year payback on average
 - **Solar projects –**
 - Long payback
 - 0% energy savings.
 - **What is most cost effective?**
-
- **Using EEB4RE, RE can be sized more efficiently, reducing initial installation costs.**

Implement

So...why are we claiming that NH's work is unique?





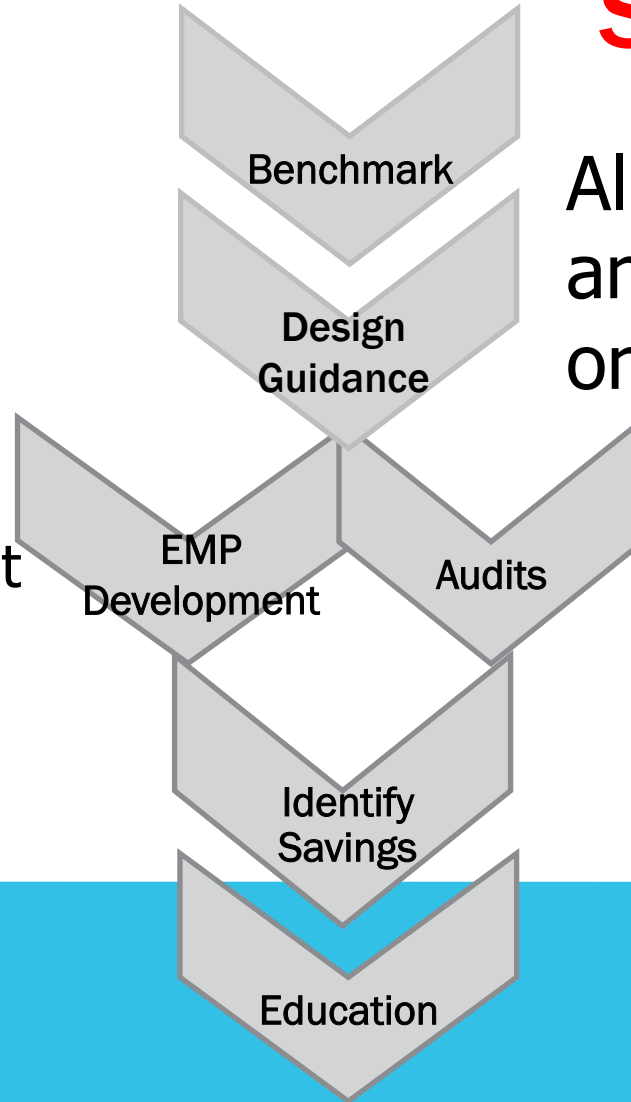
Implement

What's Next?

Project: Creating a Sustainable Energy Efficiency Program for NH's WWTFs

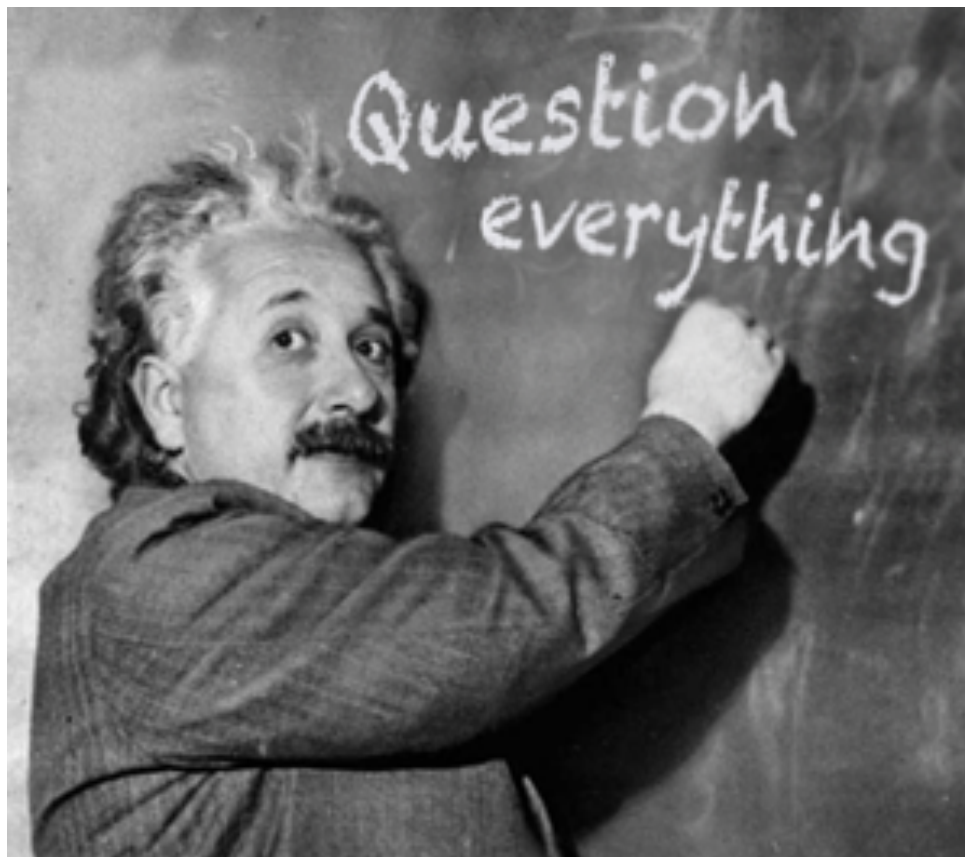
GOALS:

- Continue and Expand Benchmarking
- Develop EE design guidance document
- 15 WWTFs – TA for Energy management program development
- Audit up to 11 more WWTFs
- 33% Savings with 10-year payback
- Encourage through education and outreach



STATUS:

All work proposed and awaiting word on grant award



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