Austin Energy's District Energy & Cooling Program -

Update to Electric Utility Commission

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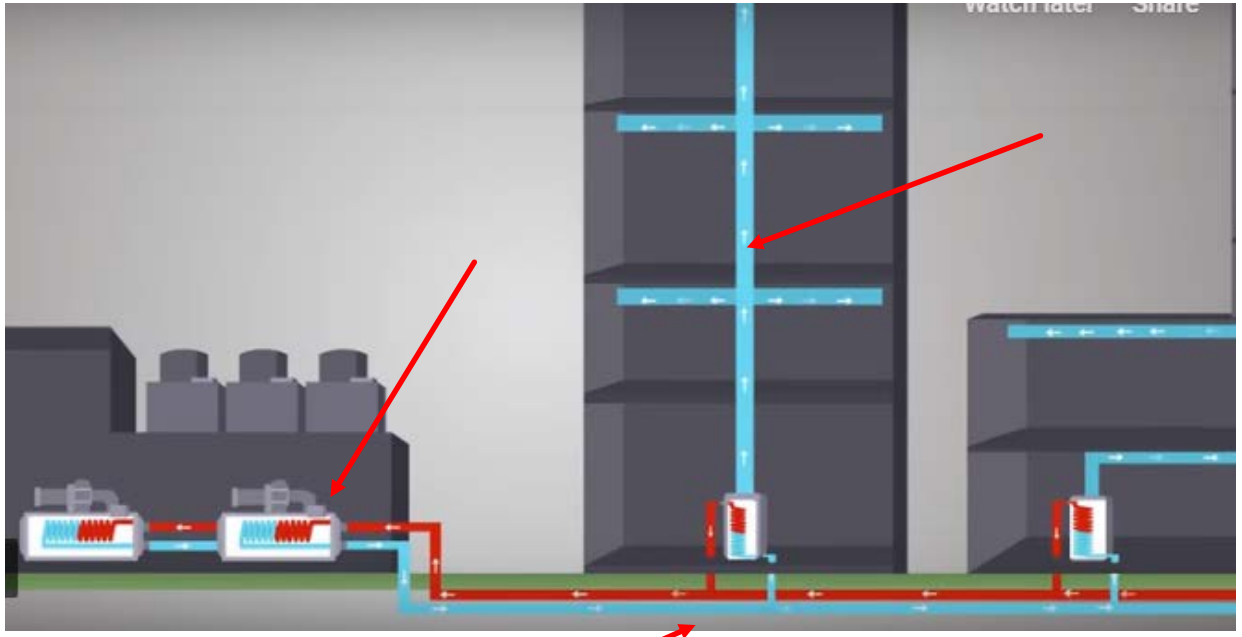
Agenda

- Overview
- 2019 Snapshot
- Benefits of Thermal Energy Storage
- Current status
- Look Ahead

District Cooling Overview

- Atlantic City
- Denver
- Houston
- Portland
- New Orleans
- Pittsburgh
- Frankfurt
- Dubai
- Paris
- Stockholm
- Helsinki



- Central plant chills water “off-peak” and cold water used “on-peak” (3-6 p.m.)
- AE sends water by UG insulated pipes to customers to cool their facilities

Benefits

To Customer:

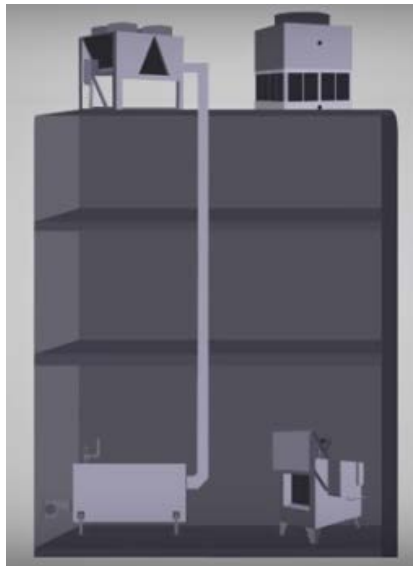
- Reduce capital costs/deferred maintenance
- Reclaims space
- Financially attractive alternative to stand alone system
- **N+1** provides extraordinary reliability
- Simplicity – low risk

To City of Austin:

- Complements economic development
  - South Central Waterfront District
  - Old Brackenridge location
- Thermal storage shifts electric demand to off-peak
  - A/C = 40% of energy usage (typical office)
  - Regulatory savings (4CP)
- Environmental stewardship
- Green Building Certification
- Stand-alone/self-supporting business
  - Supported by District Cooling customers vs. electric system customers

Benefits of Thermal Energy Storage/District Cooling

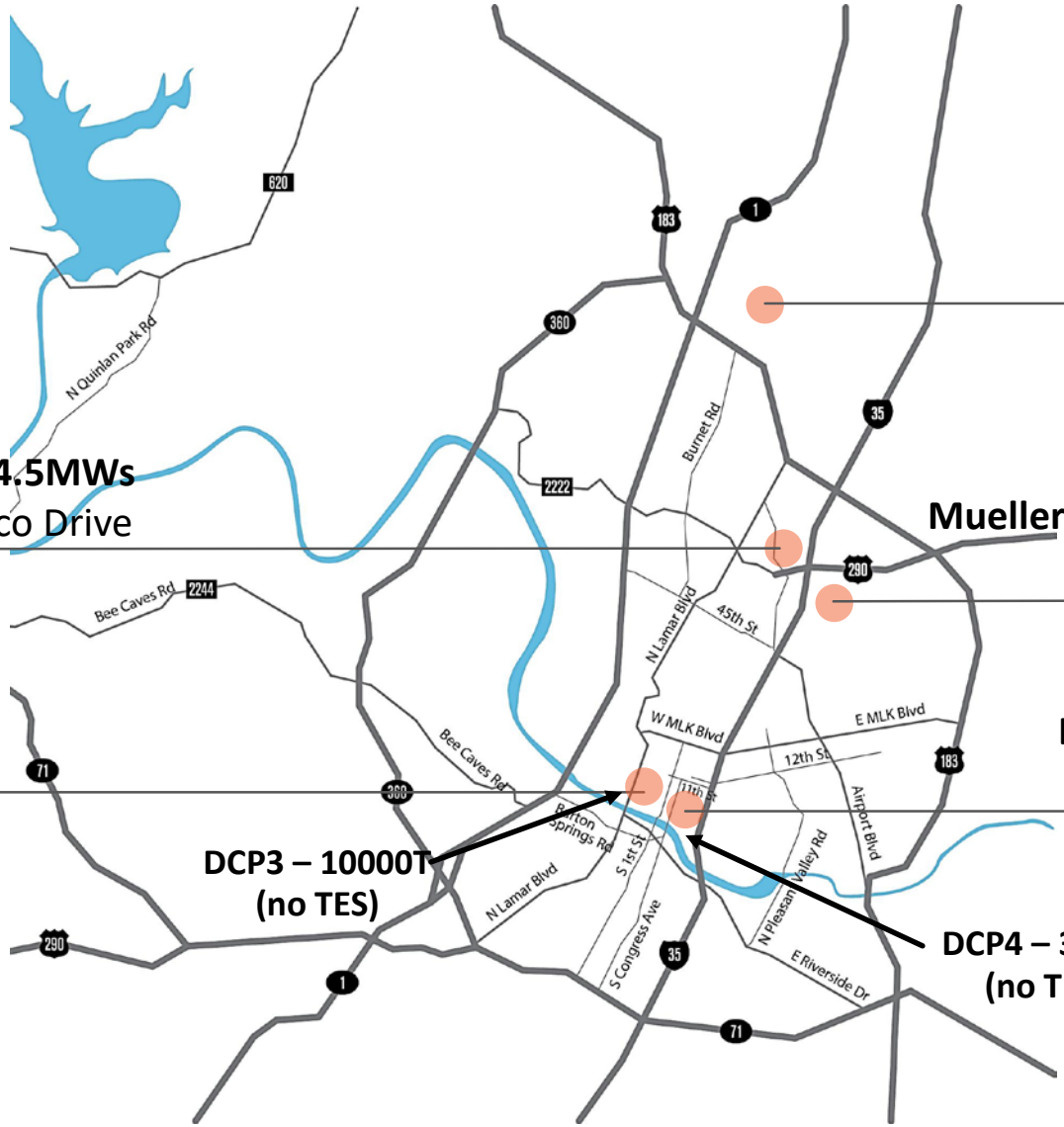
- Environmental
  - Cities: > 70% of global energy use & 40-50% of greenhouse gas emissions
    - Cooling = 50-70% peak electricity demand (International District Energy Ass'n – IDEA)
  - One of least-cost/most efficient solutions to reduce emissions & energy demand (IDEA)
  - AE: most electricity bought during early morning hours – typically wind
  - Minimal Disposal risk: At life end, steel tank easily disposed w/ minimal environmental risk (generally last ~30 yrs)
  - Reduced failure risk
    - No flammability/combustion risks with water/ice storage
    - No risk to ground water, *etc*.
- Aesthetic
  - Less electric infrastructure
  - Can use low-sound cooling towers (DCP3 and DCP4)
  - AE can make central plants unobtrusive
  - Fewer unsightly plants/cooling towers



2019 Snapshot

- 3 Systems with 4 Plants total
  - Downtown - DCP1, DCP2 (Ice **T**hermal **E**nergy **S**torage)
  - Mueller - MEC (Water TES)
  - Domain - DOM (Water TES)
- Four plants in development
  - DCP3, DCP4 (Downtown)
  - ACC (Water TES)
  - MEC2 (Water TES) (Mueller)
- 67 customers (incl. City Hall, Library)
- >20 million sq. ft. conditioned space (**>7X** Empire State Bldg)
- Currently, 19.2 MW demand shift toward AE *Resource, Generation and Climate Protection Plan* goal of 30 MW of thermal energy storage by 2027
- Electricity/Steam for Dell Children's Hospital

District Cooling Plant Current/Planned Locations



Domain – 10500T / 4MWs
3120 Kramer Lane

ACC Plant – 6000T / 4.5MWs
6018 Wilhelmina Delco Drive

Mueller Energy Center – 7300T / 2MWs
4901 Lancaster Drive

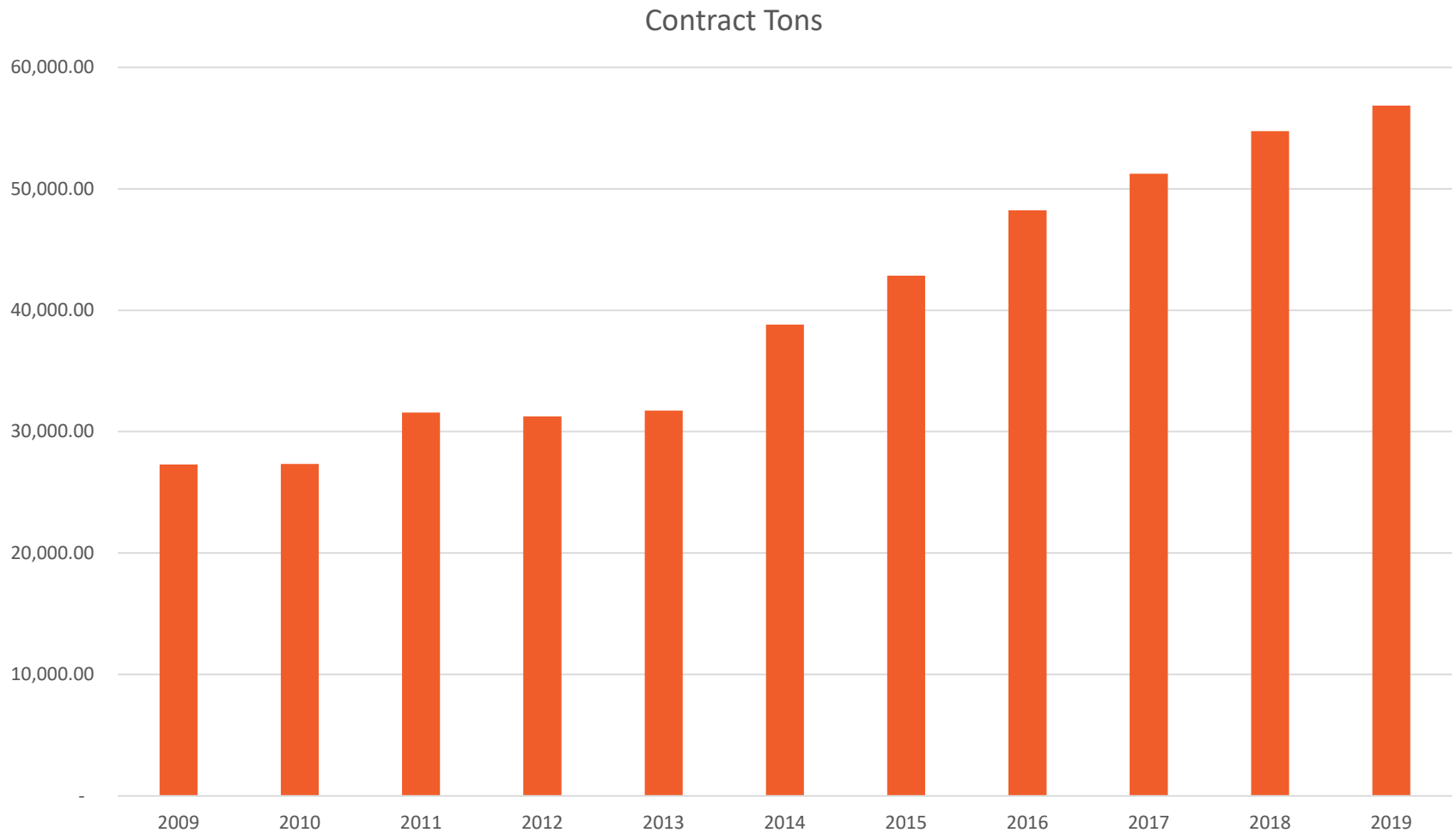
DCP1 – 6000T / 4MWs
300 San Antonio

DCP2 – 15000T / 8MWs
410 Sabine Street

DCP3 – 10000T (no TES)

DCP4 – 3000T (no TES)

Business Growth



DCP3

(Construction underway)

Adjacent to Seaholm and UPRR tracks

DCP3
(Construction underway)

Look Ahead – Satellite Plants

Austin Community College

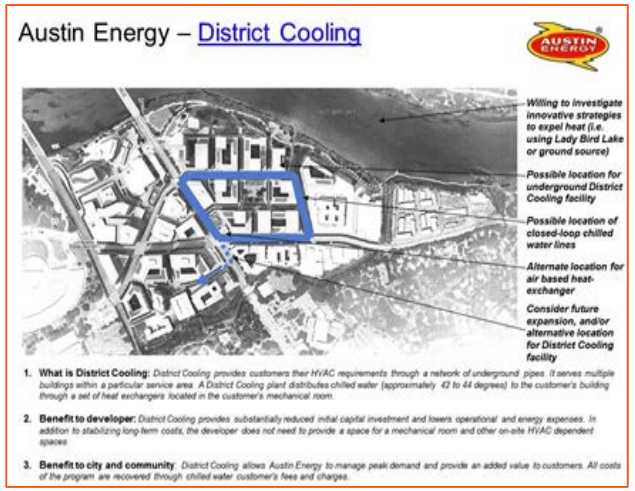
(construction started)

Continued Strong Growth

Downtown
- 8700T - Office
- 2200T – Residential

Mueller/Domain
- 5125T - Office

Other
- ABIA
- South Central Waterfront District
- HealthSouth



South Central Waterfront District

Look Ahead – Business Plan

- Manage growth & expanded operations
  - Ensure efficient operation for competitive pricing and returns
  - Phased and modular plants for capacity needs to minimize excess and shorten delivery horizons
  - *Engage with development community as early as possible*
    - Ex. 12th/Red River – City tract (Old HealthSouth tract)
      - Partner with Economic Development Department
      - Encourage developers to include plant and infrastructure in plans
    - Exploring opportunities for plants in customer buildings

Questions?