ArcGIS for District Energy

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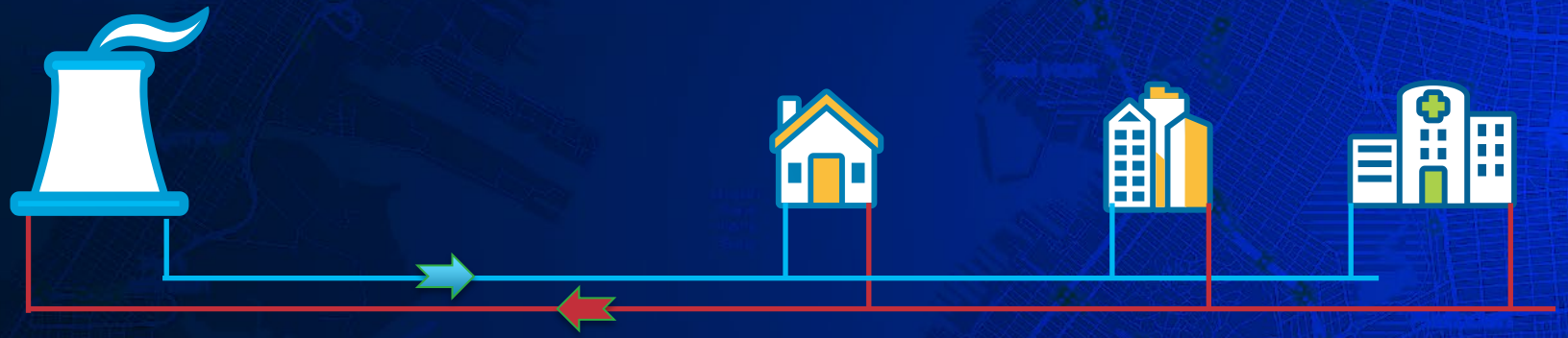
Esri

Esri Infrastructure Management &
GIS Conference

District Energy are unique pipe networks

District Heating or Steam

District Cooling



… liquid/gas is the transport mechanism of the energy and not the deliverable

District Energy Data Model

Esri has built and maintains data models for the following industries


Gas & Pipeline


Electric


Water


Storm Water

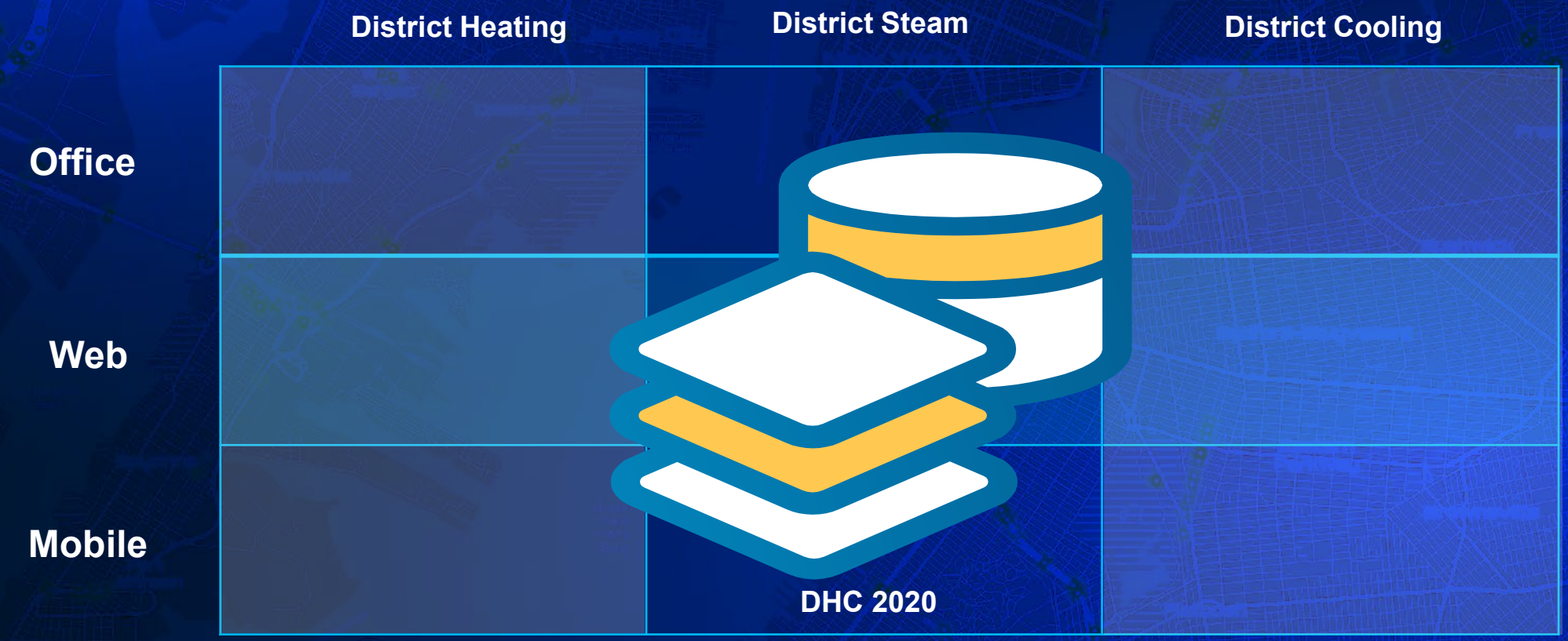

Sewer


Telco

- In 2020 Esri worked with industry partners to create a dedicated data model


District Energy

ArcGIS for District Energy



DHC 2020: Leveraging the Geodatabase

Foundation data model includes:

Classes, Fields, Subtypes, Domains, Default Values
fundamental building blocks of the geodatabase

Attribute Rules
automated calculations, restrict invalid entries, and inherent QA checks

Utility Network Rules
dictate which features can connect or associate with other types of features

Contingent Values
make values in one field dependent on values in another field

Editor Tracking
digital fingerprints for inserts, updates, and deletes

DEMONSTRATION – Utility Network

DHC 2020 – Attribute Rule Calculations

Pipe

- Calculate Pipe Surface Area from Shape_length and NominalDiameter
- Calculate Pipe Volume from Shape_Length, NominalDiameter, Wallthickness
- Calculate Pipe Slope
- Calculate CP Traceability

Device

- Calculate Device Diameter from coincident pipe feature NominalDiameter
- Calculate *AutomationStatus* based on *TurnstoClose* value (0=remote, >0=manual)
- Automatically assign Device Container content to its Assembly, StructureJunction container if within 5 meters/ 15 feet
- Calculate CP Traceability

Junction

- Automatically assign Junction Container content to its Assembly, StructureJunction container if within 5 meters/ 15 feet
- Calculate CP Traceability

DHC 2020 – Attribute Rules Constraints

Pipe

- *RetiredDate* must be greater than *InstallDate*
- *InserviceDate* must be greater than *InstallDate*
- Max temperature must be in valid range
- Nominal temperature must be in valid range
- Max pressure must be greater than operating pressure

Device

- *RetiredDate* must be greater than *InstallDate*
- *InserviceDate* must be greater than *InstallDate*
- Pump *OutletPressure* must be greater than Pump *InletPressure*

Junction

- *RetiredDate* must be greater than *InstallDate*
- *InserviceDate* must be greater than *InstallDate*

DEMONSTRATION – Attribute Rules

DHC 2020 – Contingent Values

Pipe Material and Commodity

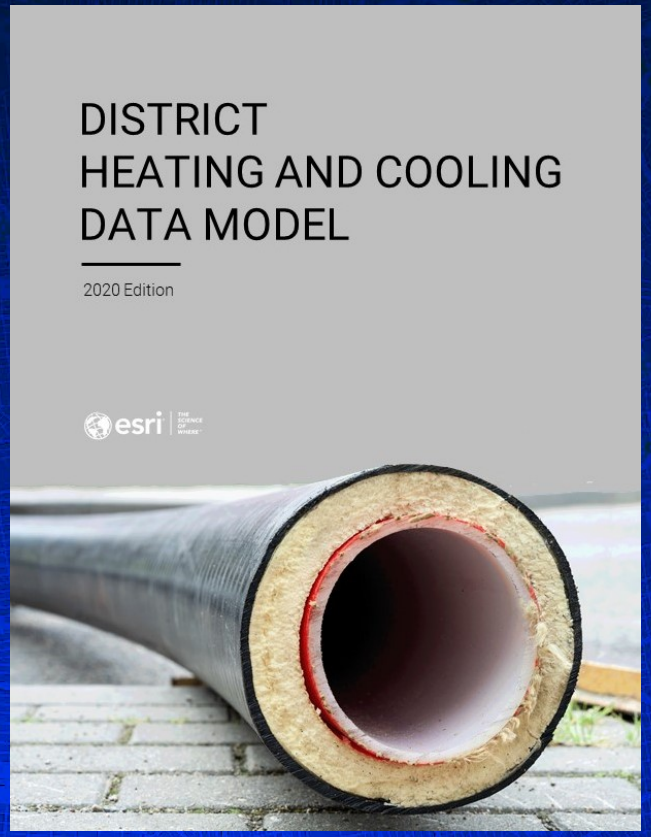
Pipe Material	Commodity (1- Heated Water)	Commodity (2-Chilled Water)	Commodity (3-Steam)	Commodity (4-Condensate)
1-Steel 2-Cast Iron 3-Ductile Iron 4-Copper 5-Brass 6-AluPEX 7-SteelFlex 8-Cement 9-Plastic PE 10-Plastic PVC 11-Plastic PEX 12-Plastic PB 13-Plastic PP 14-Asbestos 15-Fiberglass 16- Wrought Iron 17- Stainless Steel	1- Steel 2- Cast Iron (retired) 3- Ductile Iron 7- SteelFlex 11- Plastic PEX 12- Plastic PB 13- Plastic PP 14- Asbestos (retired) 15- Fiberglass	1-Steel 2-Cast Iron (retired) 3-Ductile Iron 4-Copper 5-Brass 6-AluPEX 7-SteelFlex 8-Cement 9-Plastic PE 10-Plastic PVC 11-Plastic PEX 12-Plastic PB 13-Plastic PP 14-Asbestos (retired) 15-Fiberglass	1- Steel 2- Cast Iron (retired) 3- Ductile Iron (retired) 4- Copper 5- Brass 7- SteelFlex 14- Asbestos (retired) 16- Wrought Iron (retired)	1- Steel 2- Cast Iron (retired) 3- Ductile Iron 4- Copper 5- Brass 7- SteelFlex 9- Plastic PE 11- Plastic PEX 13- Plastic PP 14- Asbestos (retired) 15- Fiberglass 17 – Stainless Steel

DEMONSTRATION – Contingent Values

Summary

- DHC 2020 is available on Esri Community website: : https://community.esri.com

  Search for: District Heating and Cooling



- DHC 2021 will be available on Esri Solutions Page in November 2021

https://www.esri.com/en-us/arcgis/products/arcgis-solutions/overview

QUESTIONS

Thank You

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