District Energy Data Management Documentation 1.1

Introduction to District Energy Data Management

District Energy Data Management can be used to map district heating and cooling assets, edit data, view system maps in the field and office, view asset reports, and collaborate with map notes.

It turns ArcGIS into a system for district energy organizations to easily inventory their assets and keep information up to date. It provides simple to use interactive system maps and dashboards for office and field staff, and increases collaboration.

After deploying, organizations with no district energy data can immediately begin mapping their district energy systems using GPS or digitizing data with web or desktop software. Organizations with existing spatial heating and cooling data can load it and begin using the apps.

Requirements

District Energy Data Management requires the following:

- ArcGIS Online
- ArcGIS Pro 2.9 or later
- ArcGIS Field Maps

Information products

District Energy Data Management includes the following:

Item	Description	Minimum user type
District Energy Data Manager	An ArcGIS Pro project package used to manage district energy system data and map notes	Professional
District Energy Editor	An ArcGIS Web AppBuilder application used to edit district energy system data and map notes	Contributor
District Energy Viewer	An ArcGIS Web AppBuilder application used to view district energy map and create map notes	Contributor
District Energy Dashboard	An ArcGIS Dashboards application used to view district energy asset information	Viewer
District Energy Map Notes Manager	An ArcGIS Web AppBuilder application used to review and manage map notes	Contributor
District Energy Mobile Viewer	A map used in ArcGIS Field Maps to view district energy system assets to view district energy system assets and view or create map notes	Mobile Worker
District Energy Asset Collector	A map used in ArcGIS Field Maps to capture and modify district energy assets and create map notes from the field	Mobile Worker

Configure District Energy Data Management

District Energy Data Management can be used to map district heating and cooling assets, edit data, view system maps in the field and office, view asset reports, and collaborate with map notes.

In this topic, you'll learn how to configure the District Energy Data Management solution to meet specific needs of your organization.

Note:

This solution is designed with Map Viewer Classic. Not using Map Viewer Classic to configure the maps can impact functionality.

Load data

In some cases, you may need to load existing data into the solution before sharing the maps or applications. Review the maps or applications provided with the solution and determine what, if any, source data you want to load. District Energy Data Management also includes a data model to store information about typical district energy system assets. To explore the schema, view the data dictionary.

Tip:

If you do have to load data into the solution, you may want to develop a source-target matrix to track how your source data will be loaded into the target layer or layers used in the solution.

Depending on the format of your source data, you may choose to append your source data to the new layers. Once you have determined what source data must be loaded, complete one of the data loading workflows below:

Use the Append tool

In ArcGIS Pro, the Append can be used to append multiple input datasets to an existing target dataset. Input datasets can be point, line, or polygon feature classes.

To append features to the target layer or layers using the Append tool, complete the steps below:

1. In ArcGIS Pro, sign in to your ArcGIS organization.
2. To open the **District Energy Data Manager** project, click **Open another project**, click **My Content** under **Portal**, double-click the **District Energy Data Management** folder, and click **District Energy Data Manager**.
3. Add your existing source layers to a new map. To add the target feature layers from the DistrictEnergySystem feature service, click **My Content** under **Portal**, double-click the **District Energy Data Management** folder, and add the DistrictEnergySystem feature service to the map.
4. On the **Analysis** tab, in the **Geoprocessing** group, click **Tools** to open the **Geoprocessing** pane.
5. In the search bar, type Append and click to open the **Append** tool.
6. Add your existing district energy data from the map to the **Input Datasets** parameter.
7. For **Target Datasets**, use the **DistrictEnergySystem** features in the map.

8. In the **Schema Type** parameter, use the drop-down menu to choose **Use the Field Map to reconcile schema differences** to perform field mapping.
9. Update your field mapping and click **Run**.
10. Repeat this process as needed to load all your existing data into the target district energy schema.

Use the Data Loading toolset

The Data Loading toolset contains tools to streamline data loading from a source schema to a target schema. The tools help reduce the time and complexity of migrating to a new data schema.

Note:

If using ArcGIS Pro 3.0 - 3.1, install the toolbox and review the Data Loading Tools documentation to learn more.

If using ArcGIS Pro 3.2 or later to load data into the solution, complete the steps below:

1. Open the **District Energy Data Manager** project.
2. Click **Tools** in the **Geoprocessing** group on the **Analysis** tab of the ribbon.
3. Expand the **Data Management Tools** then expand the **Data Loading** toolset.
4. Review the Data Loading toolset documentation to understand how to load data into the DistrictEnergySystem layers.

Configure the District Energy Data Manager ArcGIS Pro project

The District Energy Data Manager project includes a District Energy Data Manager map with broken links.

1. In ArcGIS Pro, sign in to your ArcGIS organization.
2. To open the **District Energy Data Manager** project, click **Open another project**, click **My Content** under **Portal**, double-click the **District Energy Data Management** folder, and click **District Energy Data Manager**.
3. In the **Catalog** pane, expand **Maps** and double-click **District Energy Data Manager** to open the map.
4. In the **Contents** pane, click the red exclamation point ! next to the **Map Notes** layer.

   The **Change Data Source** dialog box appears.
5. Click **My Content** under **Portal**, double-click the **District Energy Data Management** folder, double-click the **MapNotes_managing** feature service, and double-click the **Map Notes** layer.
6. In the **Contents** pane, click the red exclamation point ! next to the **Pump** layer.

   The **Change Data Source** dialog box appears.
7. Click **My Content** under **Portal**, double-click the **District Energy Data Management** folder, double-click the **DistrictEnergySystem_editing** feature service, and double-click the **Pump** layer.

   The data source is repaired for the remaining layers.
8. In the **Contents** pane, right click the **District Energy Data Manager** map and click **Properties**.

9. Click the **Coordinate Systems** tab. In the **XY Coordinate Systems Available** section select the coordinate system that matches the layers in the map.

> **Note:**
> Ensure the coordinate system of the map matches that of the feature layers deployed in the solution. If these do not match there may be discrepancies in what units are displayed in the map.

10. Click **Save** to save the project.

Add members to groups in your organization

Included with District Energy Data Management are four groups designed to help managers organize their members based on their privileges and their work. The solution includes the following groups: District Energy Editors, District Energy Field Users, District Energy Map Notes Managers, and District Energy Office Users.

To add members to the groups, complete the following steps:

1. In a browser, sign in to your ArcGIS organization.

   Verify that you have privileges to manage member groups before continuing.
2. Click **Groups** at the top of the site.
3. Locate the name of the group and click **View details** to open the details page.
4. On the **Overview** tab, click **Invite members**.
5. Check the check box next to the members that you want to add and click **Add members to group**.
6. Repeat these steps for each group that you need to add members to.

The provided groups are intended to be utilized by members with a minimum of the following user types in order to fully use the provided maps and apps:

Group name	User type
District Energy Editors	• Contributor • Creator
District Energy Field Users	• Mobile Worker
District Energy Map Notes Managers	• Contributor
District Energy Office Users	• Contributor

Set the default map extent to your service territory

When the District Energy Data Management solution is deployed into your organization, it uses the map default set in your organization. If this property has not been set, you may want to quickly update a few maps and apps to your service territory manually to avoid having to pan and zoom to your area each time you open a map. Follow the steps below to update the initial extent of the maps and apps provided with this solution.

1. In a browser, sign in to your ArcGIS organization.

2. To set the default map extent for the **District Energy Viewer** application, browse to the **District Energy Viewer** item page and click **Edit Application**.
3. On the **Map** tab, zoom the map to the desired extent and click **Use current map view** under **Set initial extent**. Click **Save**.
4. Repeat steps 2 and 3 to set the default map extent for the **District Energy Editor** and **District Energy Map Notes Manager** applications.
5. To set the default map extent for the **District Energy Asset Collector** map, open the **District Energy Asset Collector** map.
6. Zoom the map to the desired extent and save it.
7. Repeat steps 5 and 6 for the **District Energy Mobile Viewer** map.

Configure the dashboard

When you deploy the District Energy Data Management solution to your organization you have the option to change spatial reference. If you selected a spatial reference with a linear unit other than meters, you will need to revise the dashboard by completing the following steps.

1. In a browser, sign in to your ArcGIS organization.
2. To set the default map extent for the **District Energy Dashboard** application, browse to the **District Energy Dashboard** item page and click **Edit Dashboard**.
3. Navigate to the **Pipes** tab and click the configure button  on the **Transmission Main** indicator.
4. On the **Data** tab, toggle-on the value conversion switch to expose the conversion settings. Change the **Factor** setting to the correct conversion.

   The dashboard **Factor** setting is configured to convert meters to other units. Learn more about how to Convert Values.
5. On the **General** tab, click edit to modify the description. Update the description to the correct unit.
6. Click **Done** to save your changes.
7. Repeat steps 3 and 6 for each of the indicators on the **Pipes** tab.
8. Click the save button  .

Use District Energy Data Management

After deploying, organizations with no district energy data can immediately begin mapping their district energy systems using GPS or digitizing data with web or desktop software. Organizations with existing spatial heating and cooling data can load it and begin using the apps.

In this topic, you will learn how to use the solution by assuming the role of a user and performing the following workflows.

Add data in the field

In these workflows, you will be taking the role of a mobile worker collecting data in the field. If you have a mobile-centric workforce, this may be the best option to collect new data or validate existing data.

Collect flow meter features

As a mobile worker, you can collect flow meters and/or controllable valve service using ArcGIS Field Maps in the field.

1. In ArcGIS Field Maps open the District Energy Asset Collector map.
2. Browse to the collection location.
3. Tap **Add**  .
4. From the list of features, search for the type of meter. In this example you are collecting a flow meter. Search for **Flow** by swiping up or typing `flow` in the filter search bar and select **Flow** under **Meter**.

   A point is added to your location.
5. Fill in any attributes and tap **Submit**.
6. Ensure the last collected meter is selected and browse to the next meter location. Tap the **Copy** button at the bottom of the screen to copy the previously added meter to the location of the new meter.
7. Adjust the attributes and tap **Submit**.
8. If the meter has an accompanying controllable valve service, you can add it next.
9. Tap **Add**  .
10. From the list of features, search for **Service** by swiping up or typing `service` in the filter search bar and select **Service** under **Controllable Valve Service**.

    A point is added to your location.
11. Fill in any attributes and tap **Submit**.

Add map notes

As a mobile worker, you can add a map note to the system.

1. In ArcGIS Field Maps open the District Energy Asset Collector map.
2. Navigate to the map note location.
3. Tap **Add**.

4. From the list of features, search for the **Map Notes** type by swiping up or typing a description in the filter search bar, select the **Map Notes** type, and add the note to the map by sketching a polygon in the map note location.
5. Fill in the attributes and click **Submit**.

   The map note is added to the map and is available to be viewed and reviewed by others in the organization.

Add data in the web

In the workflows below, you will be taking the role of an editor adding data in ArcGIS Online. The workflows explain how to add data in the web, use the provided dashboard, and add and manage map notes.

Add service connections

As an editor, you want to use a web app to add service connections to the map.

1. In a browser, sign in to your ArcGIS organization.
2. At the top of the site, click **Groups**.
3. Browse to the **District Energy Editors** group and locate the **District Energy Editor** app. Click **View Application** to launch the app.

   In the District Energy Editor app, the **Asset Editor** widget is open by default on the left side of the window when the app opens.
4. In the **Asset Editor** pane, click the template drop-down menu and select **Service Connection**, and select **Service Connection** from the list of options.
5. Scroll down and fill in the preset values.
6. With service connection selected, click to add the service connection to the map.
7. You are prompted to update attributes and click **Save**.
8. Continue adding service connections, changing the service connection type as needed.

   The template and preset attributes remain selected so you can continue adding service connections.

Add map notes

As a user, you can add a map note to the system.

1. Browse to the **District Energy Office Users** group and locate the **District Energy Viewer** app. Click **View Application** to launch the app.
   a. In the District Energy Viewer, click the **Map Notes Editor** widget to open it.
   b. Choose a map note issue type and sketch a polygon in the desired map note location.
   c. Enter attributes and click **Save**.

      Map note changes are reflected in other apps and maps across the system so others in your organization can view the latest information.

Manage map notes

As a GIS manager, you can review and resolve map notes about your system to ensure issues are addressed.

1. Browse to the **District Energy Map Notes Managers** group and locate the **District Energy Map Notes Manager** app. Click **View Application** to launch the app.

   In the upper right of the app, there are a number of widgets that have been configured to filter, edit, update, and manage map notes.

2. Review the list of included widgets to learn how to use them to manage map notes:
   - **Legend**—View a list of included layers in the map. The legend displays what is visible on the map, so zooming in or out can expand or reduce the list if scale suppression is set on the layers.
   - **Filter**—Use the Creation Date, Issue, and Severity filters to view only map notes that fit the entered criteria. Select a date range or an option from the drop-drown menu and turn on a filter to view the selection on the map.
   - **Batch Edit Map Notes**—Select a group of map notes using one of the selection tools and update values for all the selected features at once.
   - **Map Notes Editor**—Add a new map note or edit an existing map note.
   - **Map Notes Summary**—View all the map notes by status and expand each section to view the individual notes. Click a note to zoom to it on the map and view its attributes in a pop-up.

Use the district energy dashboard

As a member of the utility, you want to have a comprehensive view of your district energy system assets.

1. Browse to the **District Energy Office Users** group and locate the **District Energy Dashboard** app.
2. From the item page, click **Open Dashboard**.
3. View the district energy system statistics on the **General** tab, click the **Asset** tab to view district energy asset details, click the **Pump** and **Heat Exchanger** to view other critical statistics.

Add data in ArcGIS Pro

In the workflows below, you will be taking the role of an editor adding data in ArcGIS Pro. If you have known locations of assets or as-built drawings, the following workflows demonstrate using ArcGIS Pro to add data to your district energy system.

> **Note:**
>
> The first time you open the District Energy Data Manager map in ArcGIS Pro, the layers will show as broken. Follow the steps to Configure the District Energy Data Manager ArcGIS Pro project to fix your layers.

Add service pipes

As an editor, you can add a service lateral and service connection to the map in ArcGIS Pro.

1. Open the **District Energy Data Manager** ArcGIS Pro project, sign in to your ArcGIS organization.
2. In the **Catalog** pane, expand **Maps** and double-click **District Energy Data Manager** to open the map.
3. On the **Edit** tab, in the **Snapping** group, click **Snapping** and turn snapping on.
4. On the **Edit** tab, in the **Features** group, click **Create**.

   The **Create Features** pane appears.
5. Select **Supply** from the **Service Pipe** template.
6. Add the template to the map by clicking at each bend of the pipe. Double-click on the map to complete the sketch of the service laterals.
7. On the **Map** tab, in the **Selection** group, click **Attributes** and fill in the attributes.
8. Repeat steps 5 through 7 to add the **Return** service pipe to the map by selecting the **Return** template in place of the **Supply** template.
9. Once both **Supply** and **Return** services have been added, you will add the **Service Connection**.
10. Select **Service Connection** from the **Service Connection** template.
11. Add the template to the map by clicking a location of the **Service Connection**.
12. On the **Map** tab, in the **Selection** group, click **Attributes** and fill in the attributes.

Add features from an as-built drawing

As an editor, you can add assets such as supply and return laterals, controllable valves, and meters to the system from an as-built drawing.

1. In the **Catalog** pane, expand **Maps** and double-click **District Energy Data Manager** to open the map.
2. On the **Map** tab, in the **Layers** group, click **Add Data**. Browse to the location of the as-built drawing, select it, and click **OK** to add it to the map.
3. With the image selected in the **Contents** pane, browse to the **Raster Layer** ribbon. On the **Appearance** tab, in the **Effects** group, change the **Layer Transparency** setting to 50%.
4. On the **Imagery** tab, in the **Alignment** group, select **Georeferencing**.

   If you are unfamiliar with georeferencing, see Overview of georeferencing in the ArcGIS Pro help.
5. On the **Georeferencing** tab, in the **Adjust** group, click **Add Control Points**.
   - Add a minimum of two control points to connect your image to your known map positions.
   - Once you have added all the control points, browse to the **Georeferencing** tab and click **Save**.
6. On the **Edit** tab, in the **Snapping** group, click **Snapping** and turn snapping on.
7. On the **Edit** tab, in the **Features** group, click **Create**.

   The **Create Features** pane appears.
8. Select an asset from the template list and add the asset to the map where it corresponds to the georeferenced as-built drawing.

9. On the **Map** tab, in the **Selection** group, click **Attributes** and fill in the attributes.
10. Remove the image from the **Contents** pane once digitizing is complete.

Add map notes

As an editor, you can add a map note to the system.

1. In the **Catalog** pane, expand **Maps** and double-click **District Energy Data Manager** to open the map.
2. On the **Edit** tab, in the **Features** group, click **Create**.

   The **Create Features** pane appears.
3. In the **Favorites** list, expand the **Map Notes** folder and choose a **Map Note** option. Add the map note by digitizing a polygon on the map at the desired location.
4. On the **Map** tab, in the **Selection** group, click **Attributes** and fill in the attributes.

   The map note is added to the map and is available to be viewed and reviewed by others in the organization.