



**AVEVAWORLD**  
PARIS



OCTOBER 2024

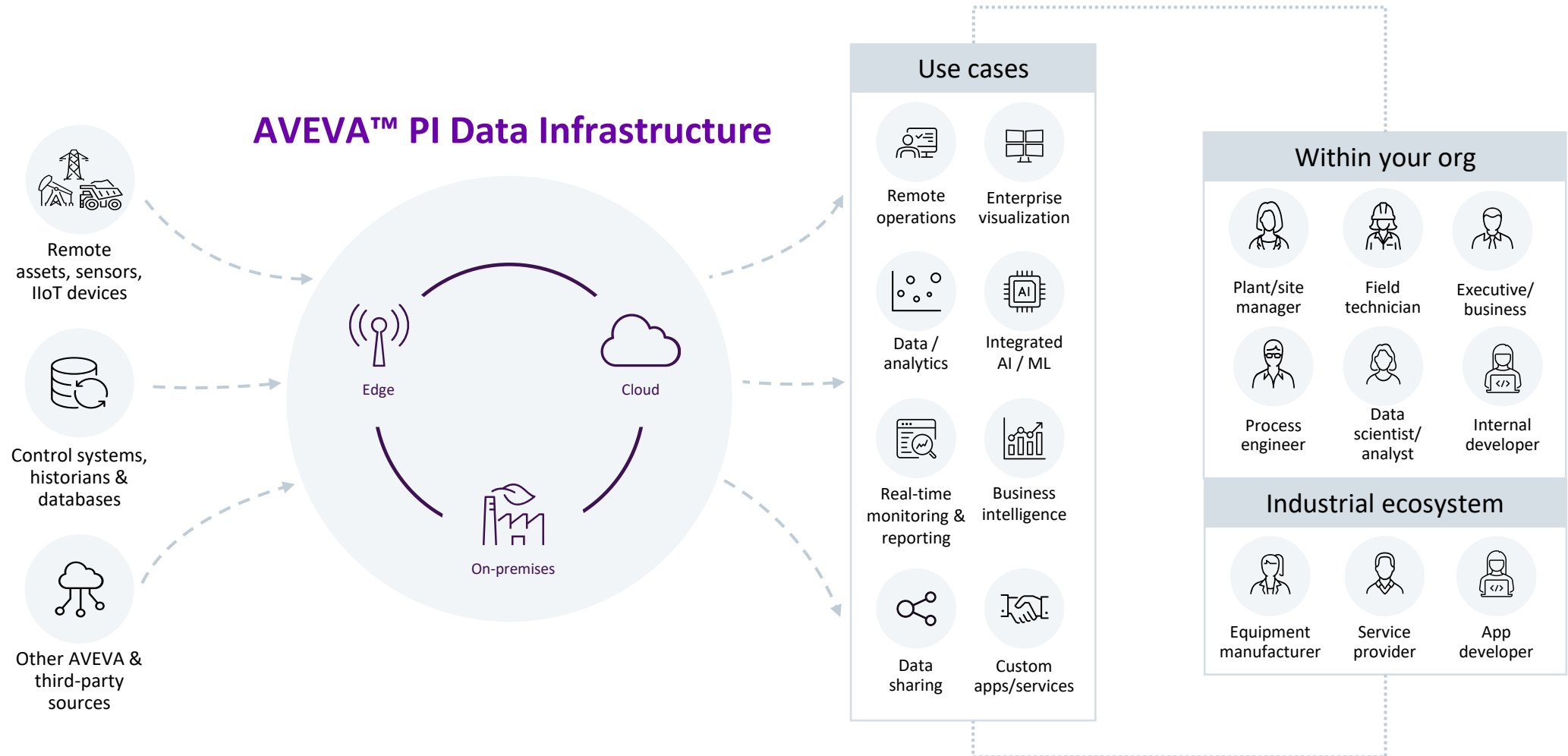
---

# Hosting PI Asset Framework's SQL database in the cloud with Azure SQL DB

Ana Revert Tomás - AVEVA

# Hybrid data infrastructure

From edge to plant to community



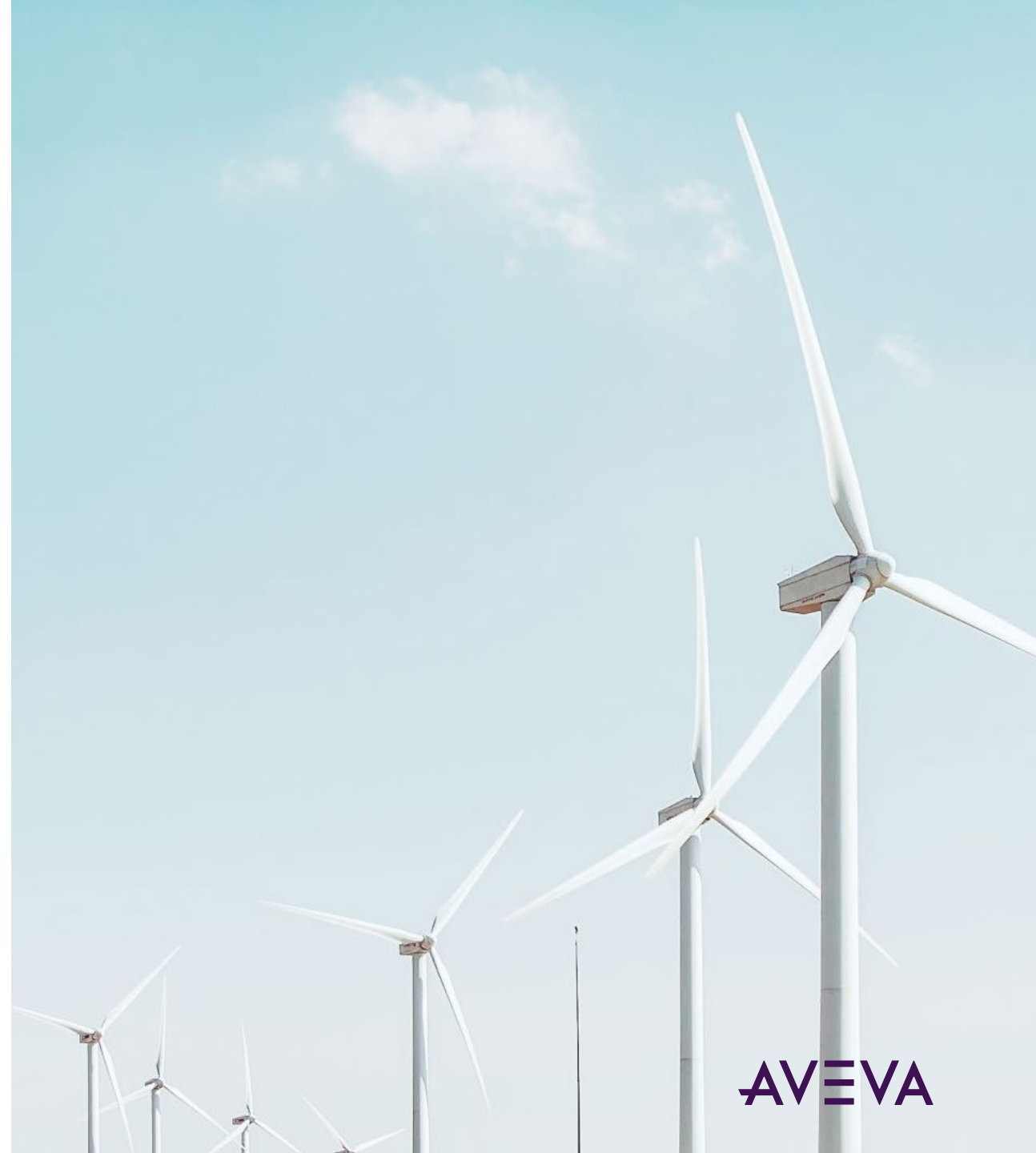


# Windtopia's AVEVA™ PI Data Infrastructure journey

What is Windtopia doing today?

## Monitor wind farms

- On-prem AVEVA™ PI System™
- Increasing scale and scope over time
- PI Connectors, data archive, asset framework, AVEVA PI Vision





# Windtopia's AVEVA™ PI Data Infrastructure journey

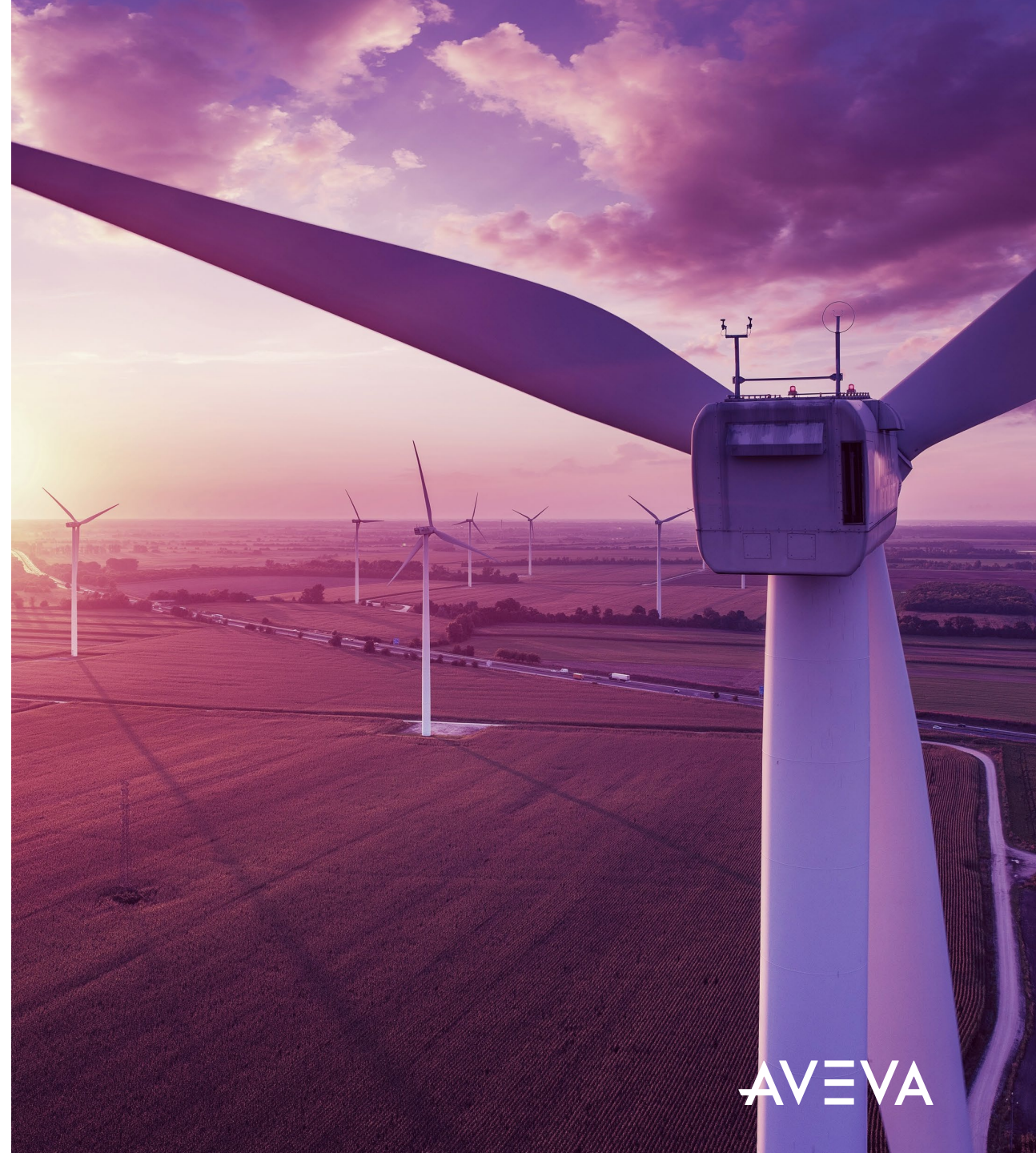
How can Windtopia prepare for the future?

Keep up with the technology  
(ML, AI, Analytics, Cloud)

Increase data-driven decisions

Create analytics to predict potential problems

How can Windtopia leverage  
AVEVA PI System to meet its goals?





# AVEVA™ PI data infrastructure

Watch Windtopia transform their data infrastructure over the course of these technical talks in AWC

**Previously:** Operations data analytics at cloud scale:

Seamless integration of PI System data with CONNECT data services

Room: Ternes Hall | 16 October, 14:45 – 15:15

**Previously:** Easily deploy AVEVA Adapters to remotely collection operations data at scale

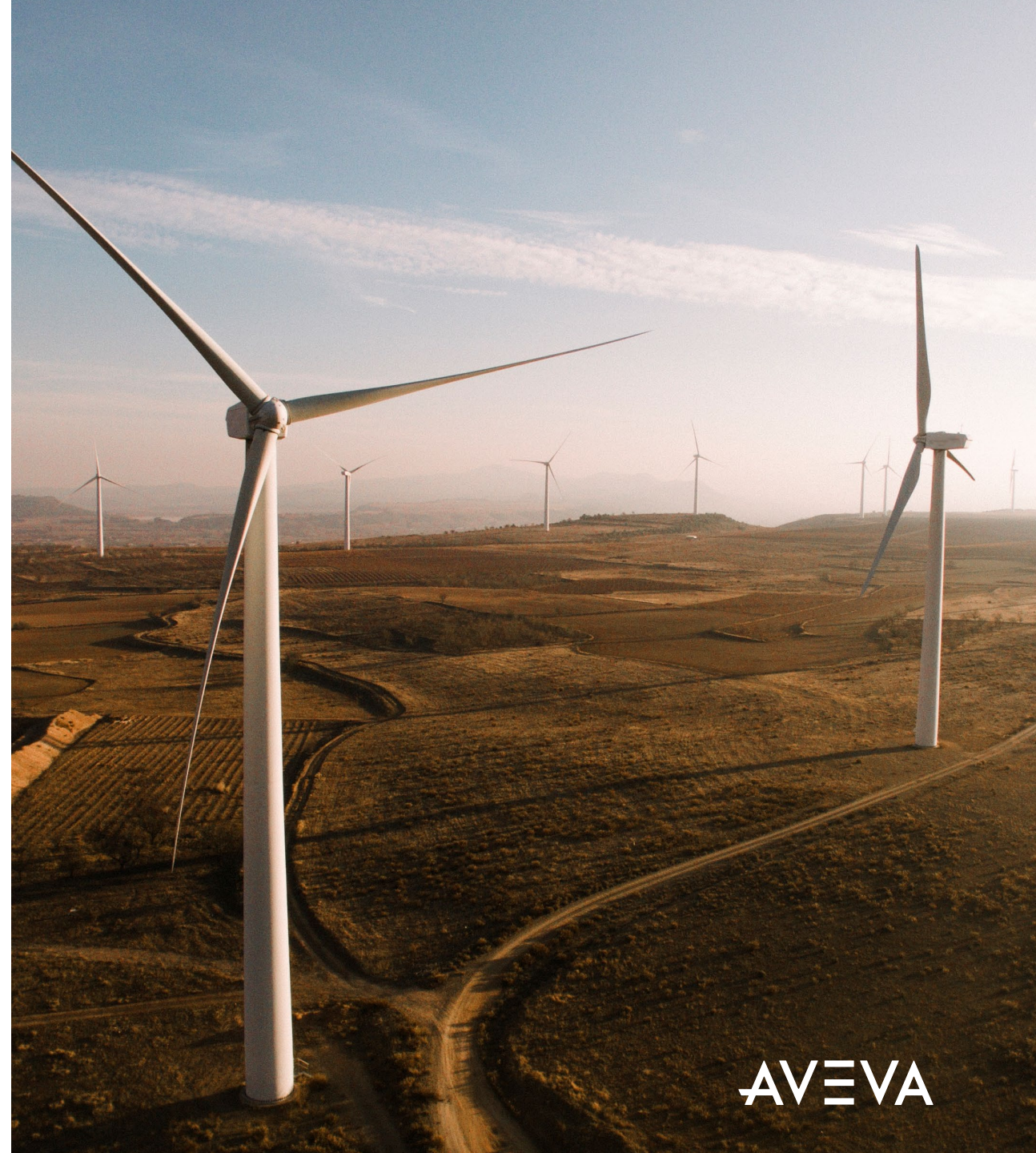
Room: #251 | 16 October, 15:30 – 16:00

**This Session:** Hosting PI Asset Framework's SQL database in the cloud with Azure SQL DB

Room: #252A+B | 16 October, 16:15 – 16:45

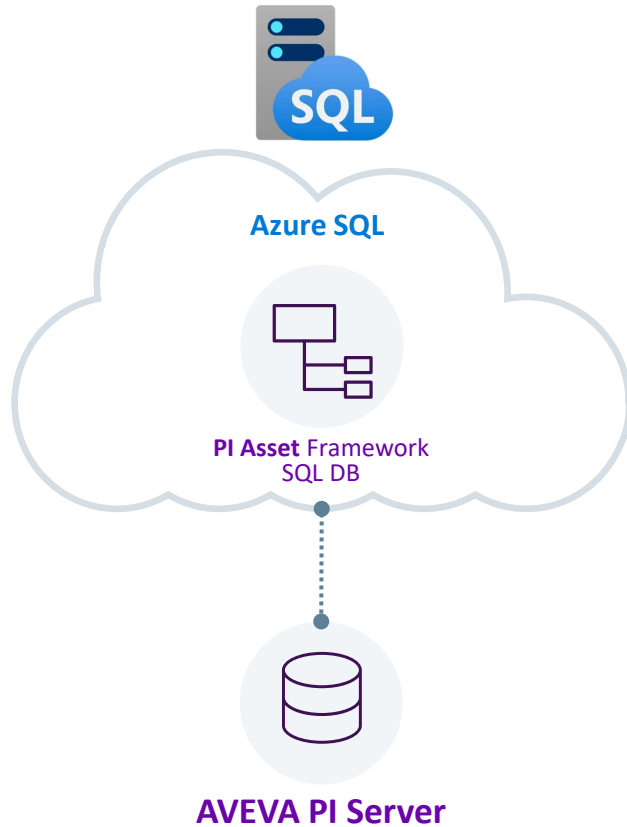
**Later:** Support expanding needs with AVEVA PI Vision 2024

Room: #241 | 16 October, 17:00 – 17:30



# Hosting PIFD in the cloud with Azure SQL DB

Why?



## Benefits

- Decrease admin work so staff can focus on operations data value
- Ease cloud migration and offload AF SQL admin tasks to Microsoft Azure
- Lower costs from IT overhead and on-demand usage with more automation

69

VOTE

### Support SQL Azure as a PI AF SQL backend

As an administrator, I want to use SQL Azure as the database backend for my PI AF databases, so that I can offload the SQL administrative tasks to Azure.

# Hosting PIFD in the cloud with Azure SQL DB

## How?

- AVEVA PI Server 2024 install kit **supports the use of Microsoft Entra managed identities** for authentication with Azure SQL.
- Managed identities provide automatic identity management in Microsoft Entra for Azure resources.



[Managed identities in Microsoft Entra for Azure SQL.](#)





# Hosting PIFD in the cloud with Azure SQL DB

How?

**AVEVA PI Server 2024 Installer (Administrator)**

## SQL Server Connection [About](#)

Enter the Microsoft SQL Server name or named instance that will host the AF SQL database.

Welcome  
Feature Selection  
Feature Rules  
**SQL Server Connection**  
SQL Server Rules  
Certificates Selection  
Service Accounts  
Summary  
Installation Progress  
Complete

**Server**

Server name: AREVERT-2016B

Example: <Server Name> or <Server Name>\<Named Instance>

**Authentication:** Windows Authentication

Validate connection to S...  
when the "AF SQL script": Microsoft Entra Managed Identity

**AF SQL Database Setup**

- AF SQL database scripts - version 3.1.0.1079 will be installed
- AF SQL script execution - version 3.1.0.1079 will be installed

Since the PI AF Application Service will be installed, you have the option to change your feature selections related to AF SQL database setup on this view. Script execution can run against local or remote SQL Servers.



# Types of managed identities



## System-assigned

- Create with Azure Resource
- Automatic identity lifecycle management
- Cannot be shared with multiple resources



## User-assigned

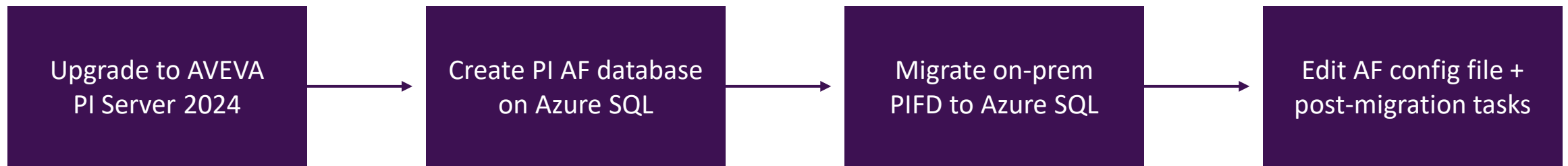
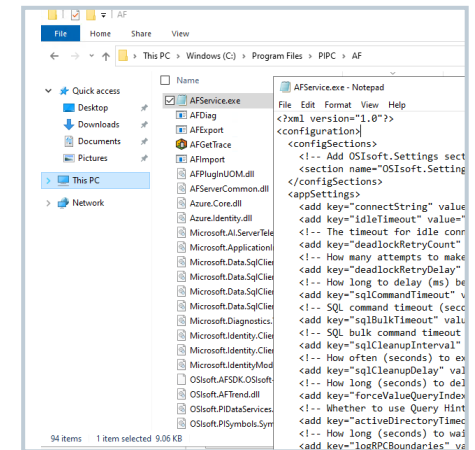
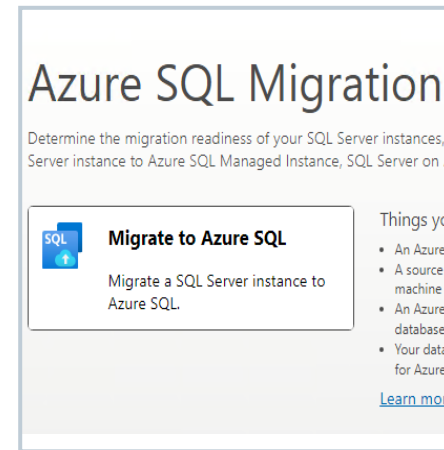
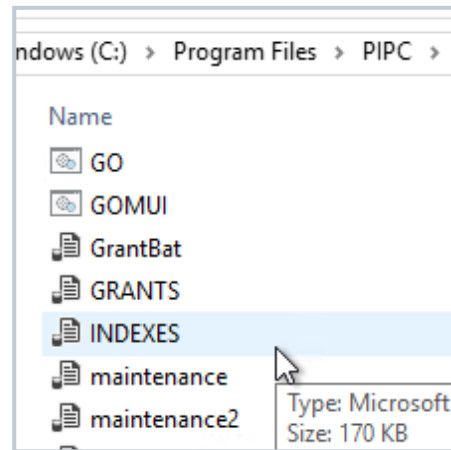
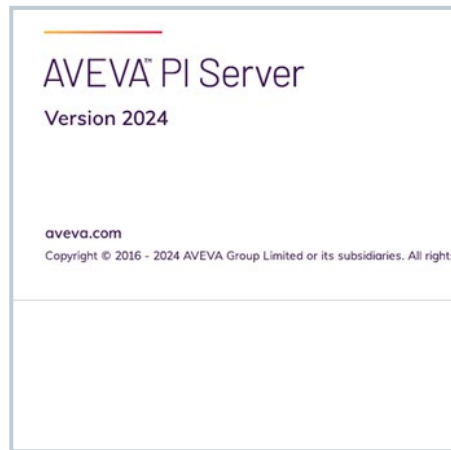
- Create independently
- Manual identity lifecycle management
- Can be shared with multiple resources

# Hosting PIFD in the cloud with Azure SQL DB

How?

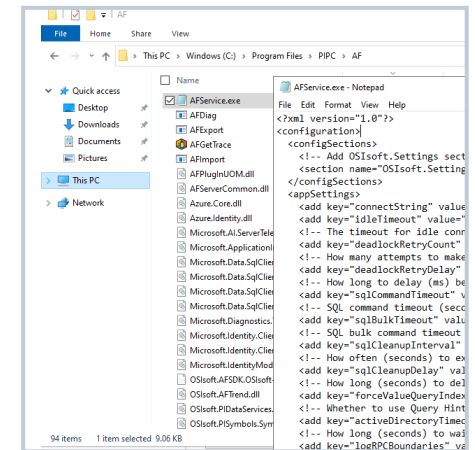
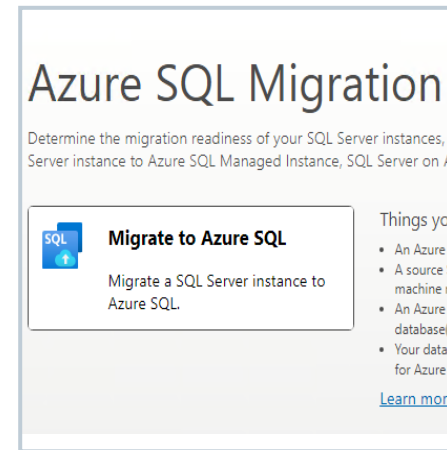
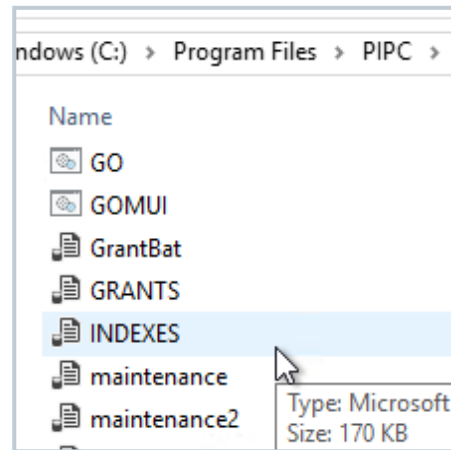
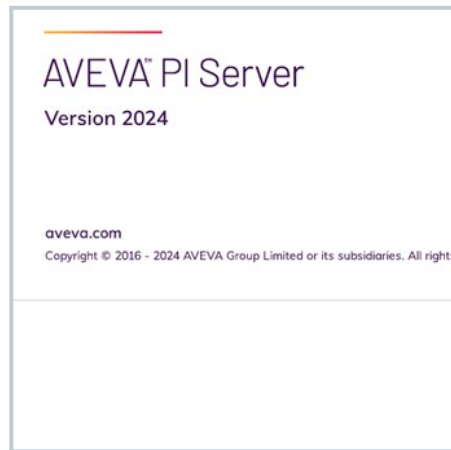
# Migrate PIFD to Azure SQL

## Main steps



# Migrate PIFD to Azure SQL

## Upgrade to AVEVA PI SERVER 2024



Upgrade to AVEVA PI Server 2024

Create PI AF database on Azure SQL

Migrate on-prem PIFD to Azure SQL

Edit AF config file + post-migration tasks

Installation kits

File Home Share View

This PC > Downloads > Installation kits

Name	Date modified	Type	Size
AVEVA PI Server_2024	9/11/2024 5:36 AM	Application	592,545 KB

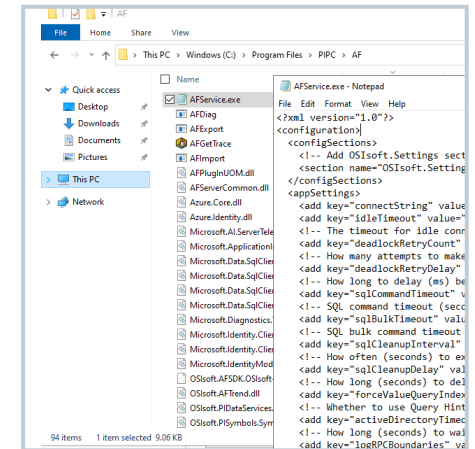
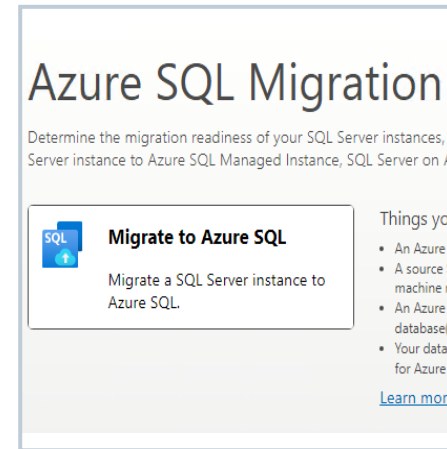
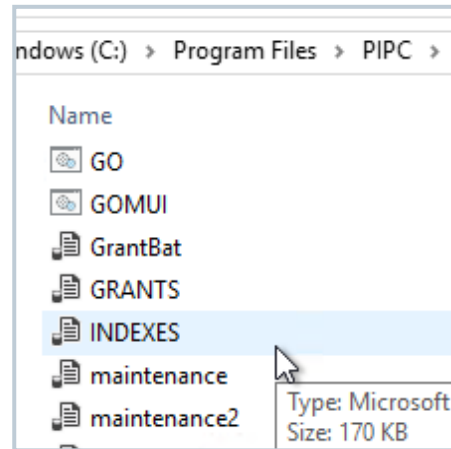
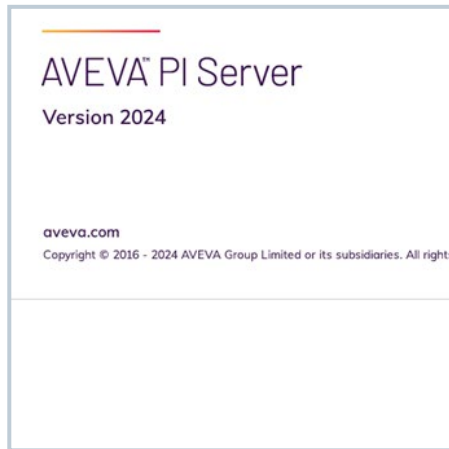
1 item

Gmail Images

Customize Chrome

# Migrate PIFD to Azure SQL

## Create PI AF database on Azure SQL



Upgrade to AVEVA  
PI Server 2024

Create PI AF database  
on Azure SQL

Migrate on-prem  
PIFD to Azure SQL

Edit AF config file +  
post-migration tasks

- Quick access
- Desktop
- Downloads
- Documents
- Pictures
- AF
- SQL
- This PC
- Network

Folders (7)

3D Objects Desktop Documents Downloads

Music Pictures Videos

Devices and drives (2)

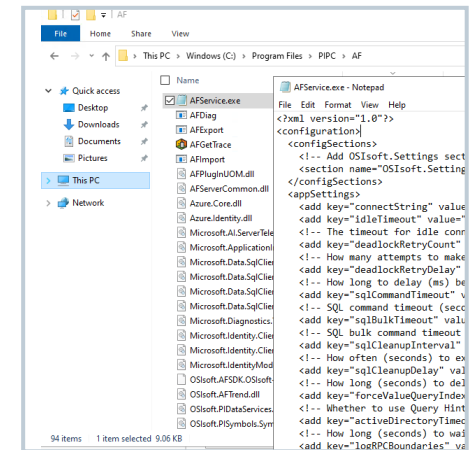
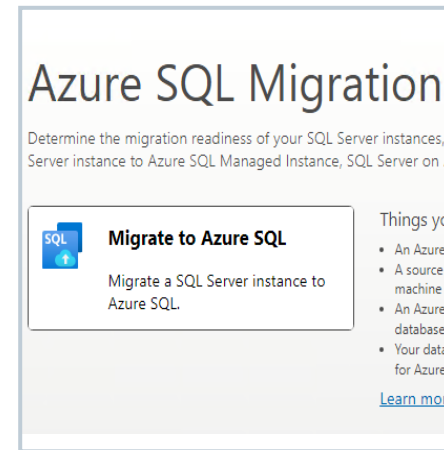
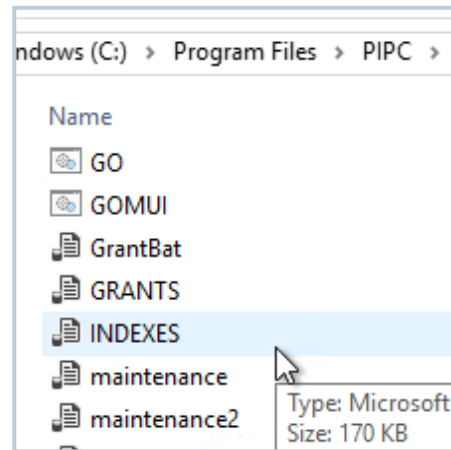
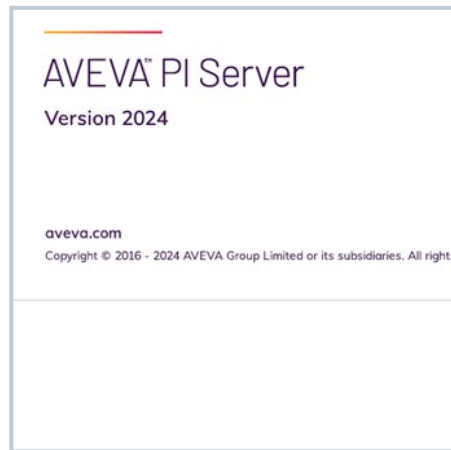
Windows (C:) 110 GB free of 126 GB

Temporary Storage (D:) 3.47 GB free of 3.99 GB



# Migrate PIFD to Azure SQL

## Migrate on-prem PIFD to Azure SQL



Upgrade to AVEVA  
PI Server 2024

Create PI AF database  
on Azure SQL

Migrate on-prem  
PIFD to Azure SQL

Edit AF config file +  
post-migration tasks

Elements

- Elements
  - Generation
  - PI Data Archive
- Element Searches

- Elements
- Event Frames
- Library
- Unit of Measure
- Contacts
- Management

2 Elements

Elements

Group by:  Category  Template

Search

Name	Description	Category
Generation		
Windtopia		
Big Buffalo Wind Farm		
GE01		Wind Turbine
GE02		Wind Turbine
GE03		Wind Turbine
GE04		Wind Turbine
Black Mesa Wind Farm		
GE05		Wind Turbine
GE06		Wind Turbine
GE07		Wind Turbine
Black Wolf Wind Farm		
GE08		Wind Turbine
GE09		Wind Turbine
GE10		Wind Turbine
PI Data Archive		

Search Elements

Element Templates

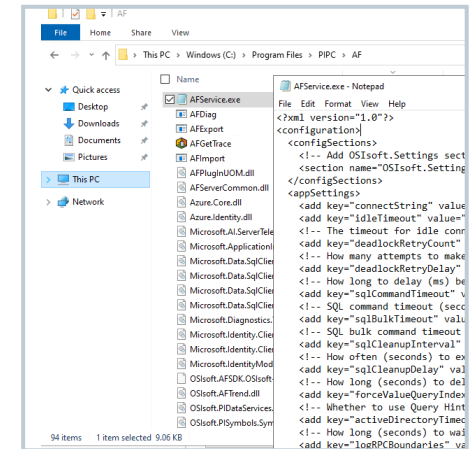
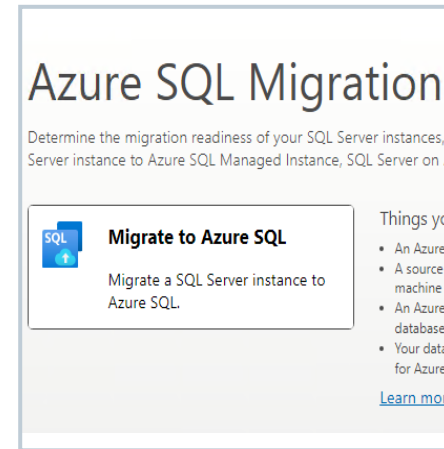
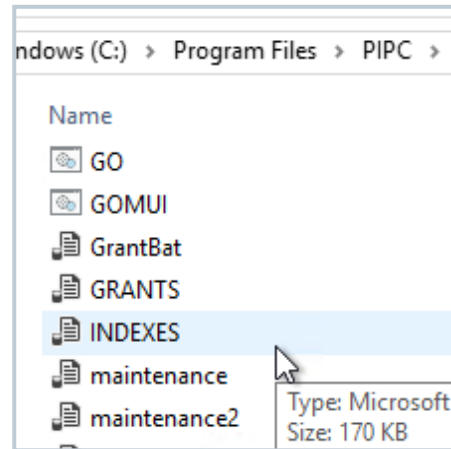
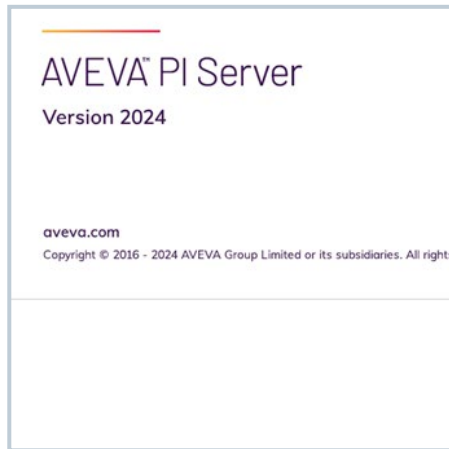
Filter

- Windtopia Wind Farm Fleet
- Windtopia Wind Farm Template
- Windtopia Wind Turbine

Drag Element Templates to Elements to create new Elements.

# Migrate PIFD to Azure SQL

## Edit AF config file + post-migration tasks



Upgrade to AVEVA PI Server 2024

Create PI AF database on Azure SQL

Migrate on-prem PIFD to Azure SQL

Edit AF config file + post-migration tasks

# Modify the PI AF Application Service connect string

## TABLE OF CONTENTS

Create and configure SQL Server login

[Modify the PI AF Application Service connect string](#)

Connect PI System Explorer and PI AF server >

Security configuration for PI MDB to AF Link feature

Security configuration for external tables >

PI AF and Kerberos >

Firewalls and PI AF security >

# Modify the PI AF Application Service connect string

Sep 16, 2024 | 3 minute read | [PI System](#) [PI Server 2024](#)

This topic provides instructions and code examples of how to modify the PI AF Application Service connection string for the following reasons:

- Specify a PI AF Azure SQL database and Microsoft Entra managed identity for authentication
- Specify the PI AF SQL Server database and SQL Server security mode
- Change the authentication mode, connection credentials, and add a SQL Server user and password

**Note:** It is important that you restrict access to the `AFService.exe.config` file to authorized users only, including the

## In This Topic

[Specify a PI AF Azure SQL database with a user-assigned managed identity](#)

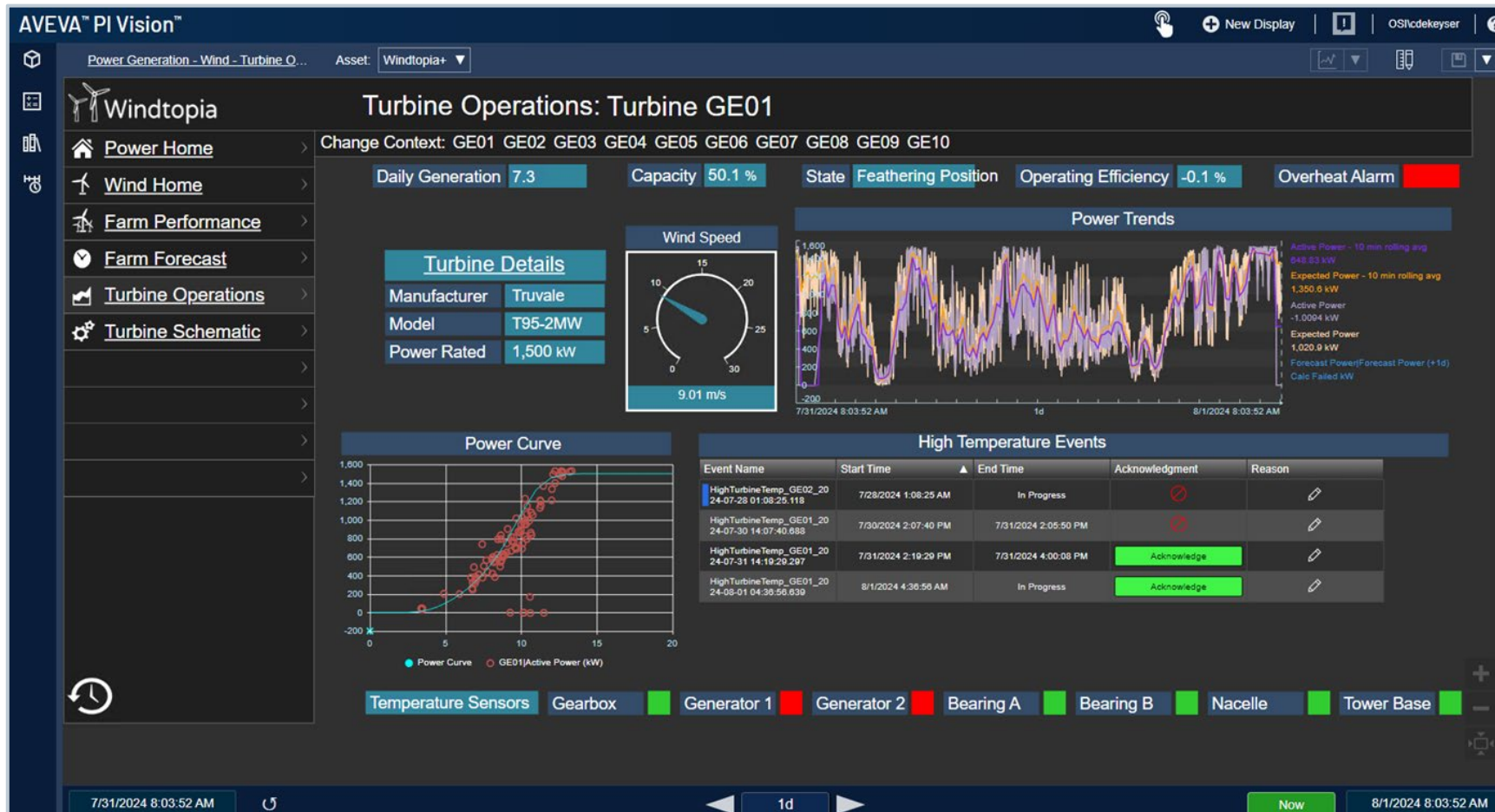
[Specify a PI AF Azure SQL database with a system-assigned managed identity](#)

[Specify a PI AF SQL Server database](#)



# Migrate PIFD to Azure SQL

Connect from any client



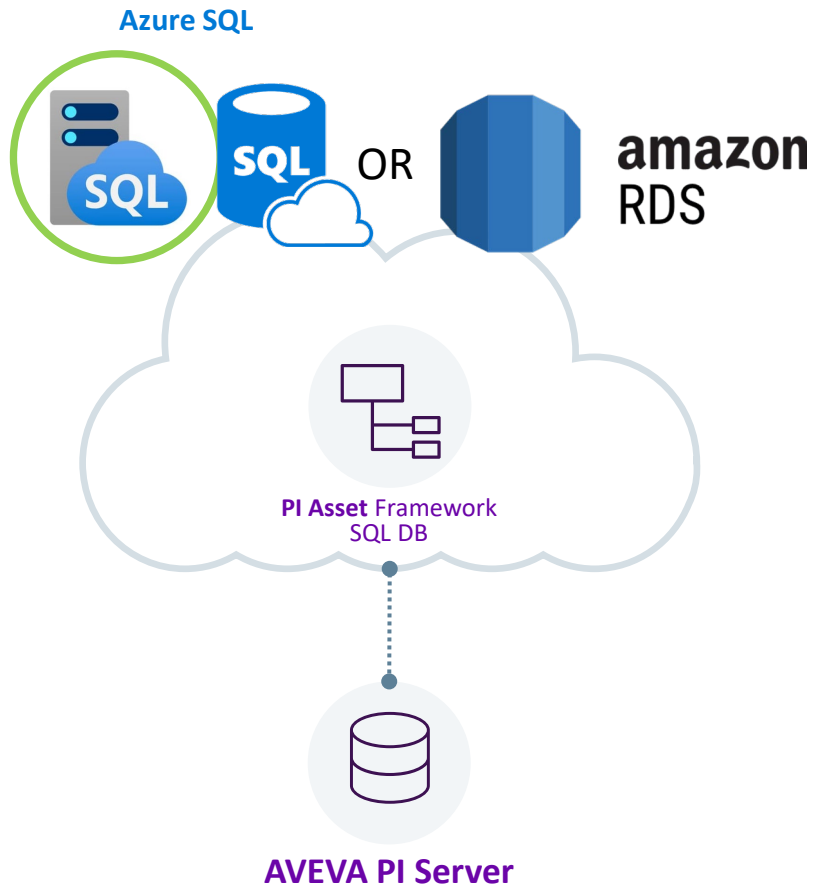
# Migrate PIFD to Azure SQL

## Things to keep in mind

- No AF Collective or audit trail support on Azure.
- No RTQP support for PIFD on AZURE SQL DB at this time. RTQP still works with AVEVA PI AF 2024 on MS SQL.
- SQL Server and maintenance jobs. You can run the maintenance job manually using the AFDiag utility with the /MaintenanceJob parameter.



# What's coming?



## Features

- Host PI Asset Framework SQL database on Azure SQL DB, Azure Managed SQL Instance, or Amazon RDS
- RTQP support for PIFD on cloud-managed SQL

## Benefits

- Decrease admin work so staff can focus on operations data value
- Ease cloud migration and offload AF SQL admin tasks to Microsoft Azure or AWS
- Lower costs from IT overhead and on-demand usage with more automation

# NEW! Meet the experts

## 1:1 meetings with AVEVA subject-matter experts

- Get answers to product and technical questions, learn best practices, tips and tricks, and more.
- Representatives from:
  - Product management
  - R&D
  - Pre-sales
  - Tech services
  - Support
  - Customer success





# Innovation zone

Exciting, modern & engaging experience

**5 key zones:** CONNECT, operate & optimize, design & build, industrial sustainability, experiential zone (hands-on activities)

**45+ sponsor and exhibitor booths**

CONNECT ecosystem partner kiosk

Partner solution sessions

Guided tours by industry

Game and leisure areas

# Ana Revert Tomás

System Engineer

AVEVA

*ana.reverttomas@aveva.com*



This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

#### ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at [www.aveva.com](https://www.aveva.com)