

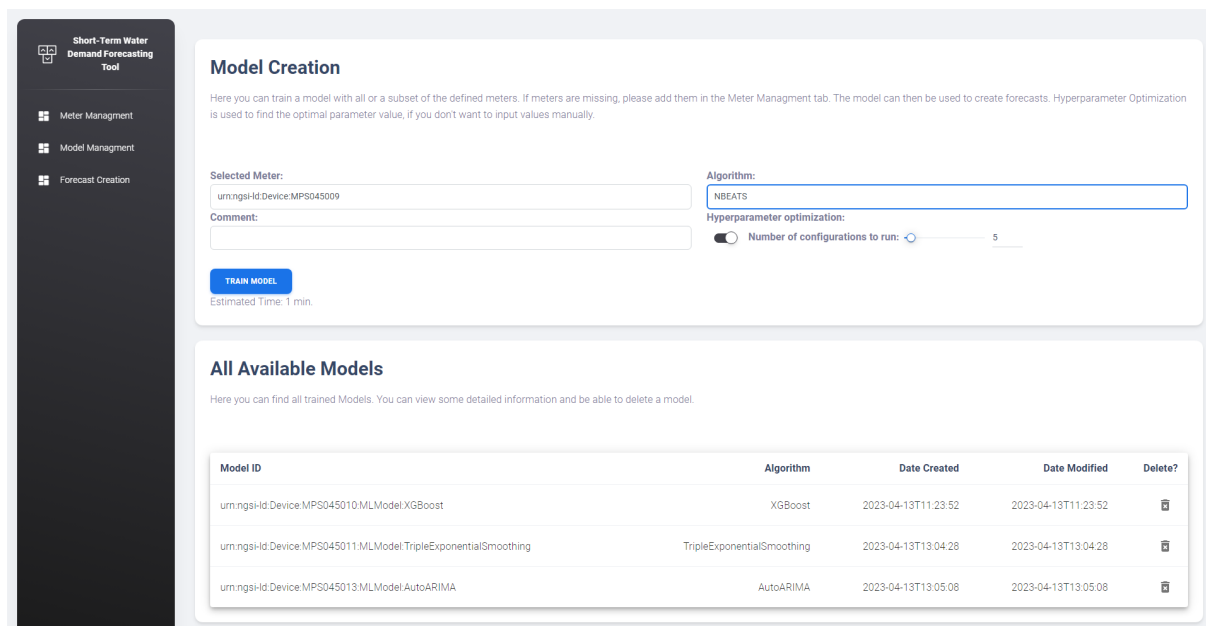


## Product factsheet




# Short-term demand forecasting tool

Software solution

Consulting or service offering (e.g. training)



The screenshot shows the 'Model Creation' interface of the Short-Term Water Demand Forecasting Tool. On the left is a dark sidebar with navigation options: 'Short-Term Water Demand Forecasting Tool', 'Meter Management', 'Model Management', and 'Forecast Creation'. The main content area is titled 'Model Creation' and includes a brief description: 'Here you can train a model with all or a subset of the defined meters. If meters are missing, please add them in the Meter Management tab. The model can then be used to create forecasts. Hyperparameter Optimization is used to find the optimal parameter value, if you don't want to input values manually.' Below this, there are input fields for 'Selected Meter:' (containing 'urn.ngsi-Id:Device:MPS045009'), 'Algorithm:' (set to 'NBEATS'), and 'Comment:'. A 'Hyperparameter optimization:' section has a toggle switch and a slider for 'Number of configurations to run:' set to 5. A blue 'TRAIN MODEL' button is present, with 'Estimated Time: 1 min.' below it. The second section, 'All Available Models', states 'Here you can find all trained Models. You can view some detailed information and be able to delete a model.' It contains a table with the following data:

Model ID	Algorithm	Date Created	Date Modified	Delete?
urn.ngsi-Id:Device:MPS045010:MLModel:XGBoost	XGBoost	2023-04-13T11:23:52	2023-04-13T11:23:52	
urn.ngsi-Id:Device:MPS045011:MLModel:TripleExponentialSmoothing	TripleExponentialSmoothing	2023-04-13T13:04:28	2023-04-13T13:04:28	
urn.ngsi-Id:Device:MPS045013:MLModel:AutoARIMA	AutoARIMA	2023-04-13T13:05:08	2023-04-13T13:05:08	

## Description

Two main components:

1. Backend service that allows to train models and create water demand predictions. The service is reachable through its own REST API (documented in OpenAPI), as well as through the Orion context broker (FIWARE).
2. Frontend service that is used to interact with the backend and visualize forecasts or model training results. This component is optional in case a frontend service already exists at the user's organization where the product can be integrated.

**Training material** for the short-term demand forecasting tool is available at <https://youtu.be/6vR797Oainl>.

Target audience

Water utility that has the software engineering capabilities to integrate the tool into their system. The user that interacts with / applies the tool needs to be able to use a browser and interpret data from the water domain (e.g., water demand line plots).

## Actors, their roles and interactions

The tool is meant to be used by water utilities. Depending on their expertise, they might need help from external IT experts to integrate the tool into their system before it can be applied.

## Unique selling points

The tool offers a wide variety of algorithms to create water demand forecasts, ranging from traditional, purely statistical methods to modern deep learning approaches. It is possible to automatically discover the best performing method for the specific use case or alternatively choose the method that the user has the most trust in already.

## Technical requirements

Software engineering expertise to integrate the components (FIWARE components + backend + frontend) into the network and system of the water utility. All components are provided in form of docker containers. Additional expertise is required to install smart meter devices and connect them to the system such that the pre-processed smart meter data is accessible to the tool. The tool comes in form of docker containers and is thus independent of the specific OS.

## Software data

- License: Open-source.

## URL

<https://github.com/iwwtech/bws-short-term-forecasting>

## Technology applied by the product

- [Water recovery technologies for water reuse](#)

## Case Study applying the product

### East Frisia, Germany



<https://mp.watereurope.eu/d/CaseStudy/19>

### Related tags

Residential

Water demand

Industrial

Agricultural

Machine learning