ISA-PM-IPA-2021-01-09-ISO2PT-GRP-Electricity Demand Response Forecast and Notification

Electricity Demand Response Forecast and Notification

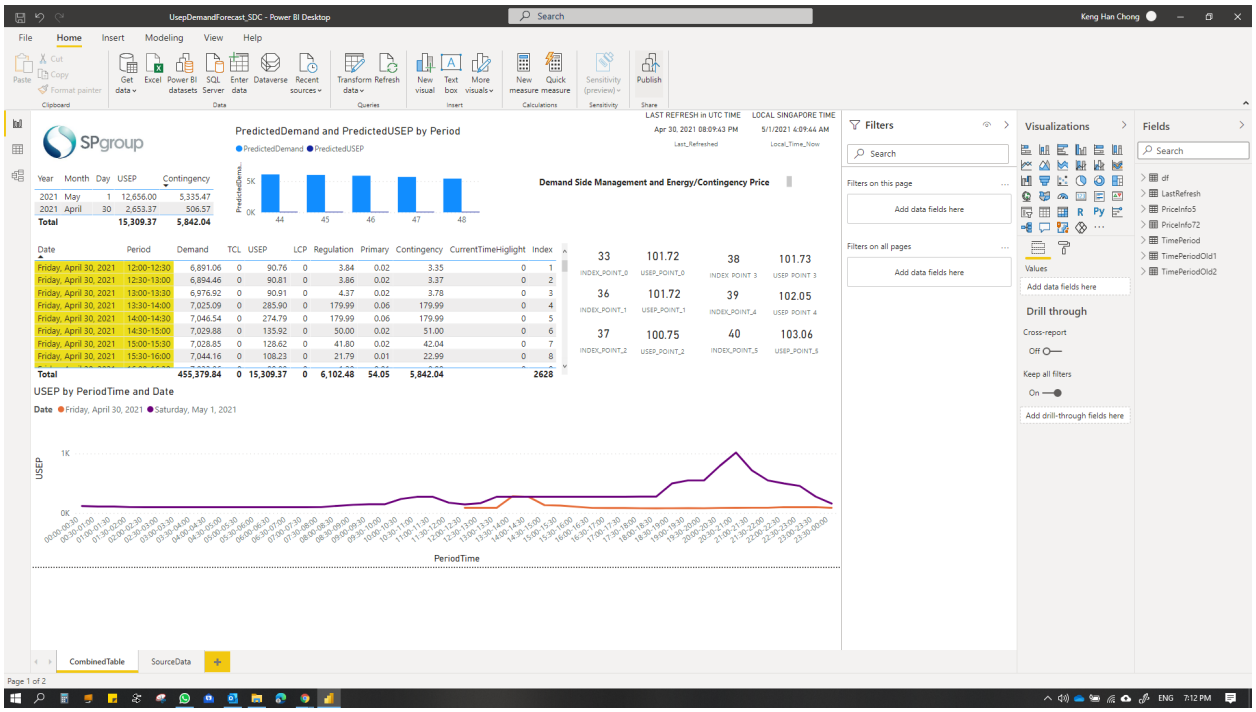
NUS-ISS Master of Technology (Intelligent Systems)

Installation Guide

Full Name	Student ID	Email
Harry Chan	A0213530X	e0508631@u.nus.edu
Chong Keng Han	A0213547H	e0508648@u.nus.edu
Wen Cheng	A0213572L	e0508673@u.nus.edu
Sivasankaran Balakrishnan	A0065970X	e0507972@u.nus.edu

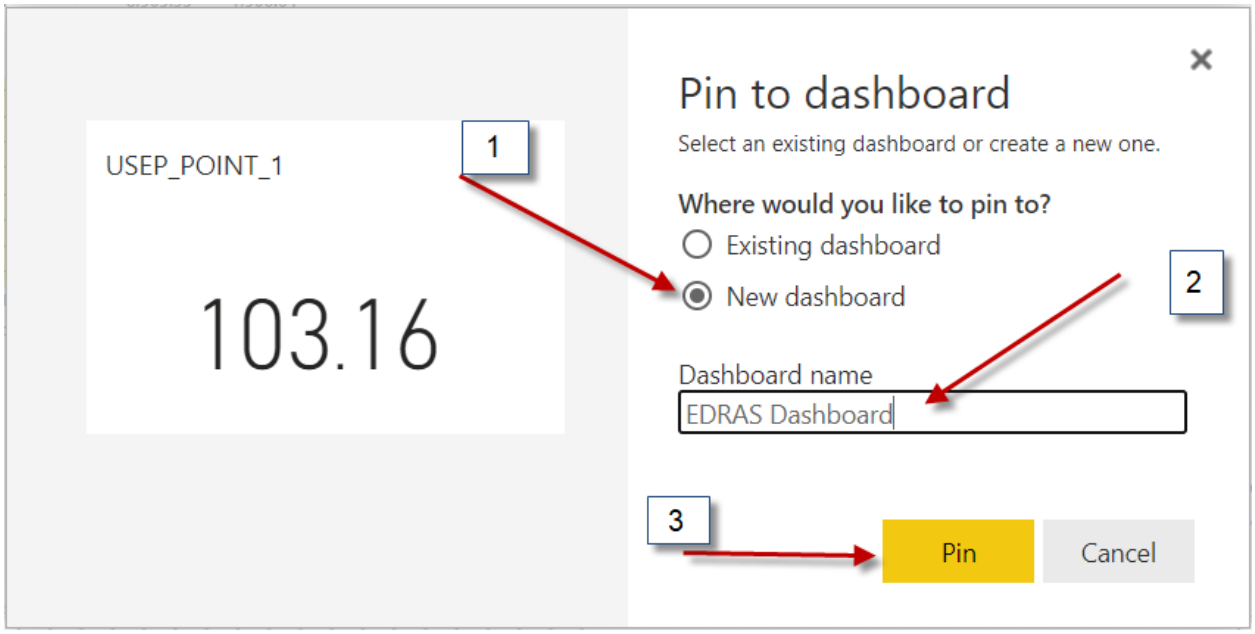
1. Publish Power BI PBIX file

Publish the pbix file into Power BI Cloud. Note: you need to have a valid Power BI account to do this, it can be a demo account if you don't have the paid license. You can publish it to your own personal workspace.



2. Create the USEP Price Tiles in the Power BI Dashboard

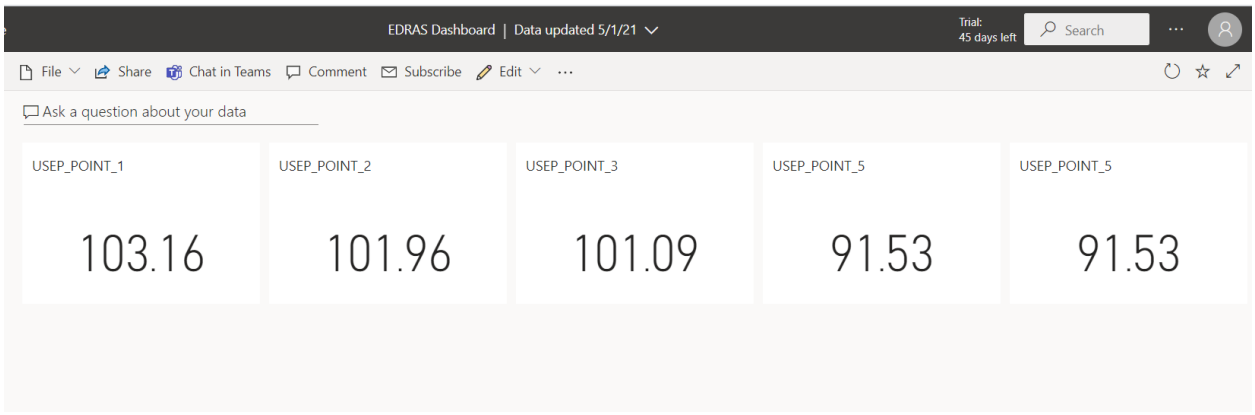
Open the Power BI Report in the Power BI cloud website and pin 5 visuals: USEP_POINT_1, USEP_POINT_2, USEP_POINT_3, USEP_POINT_4 and USEP_POINT_5 into a newly created Power BI Dashboard. Let's say we name it as EDRAS Dashboard



Repeat the above steps for USEP_POINT_2 to USEP_POINT_5

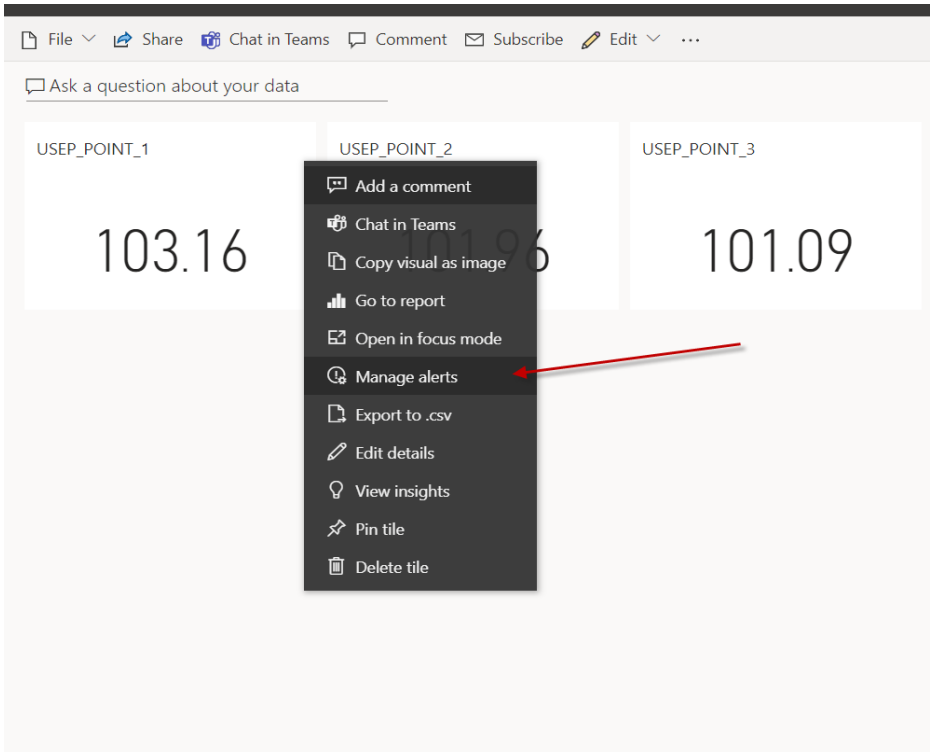
3. Open up the Power BI Dashboard

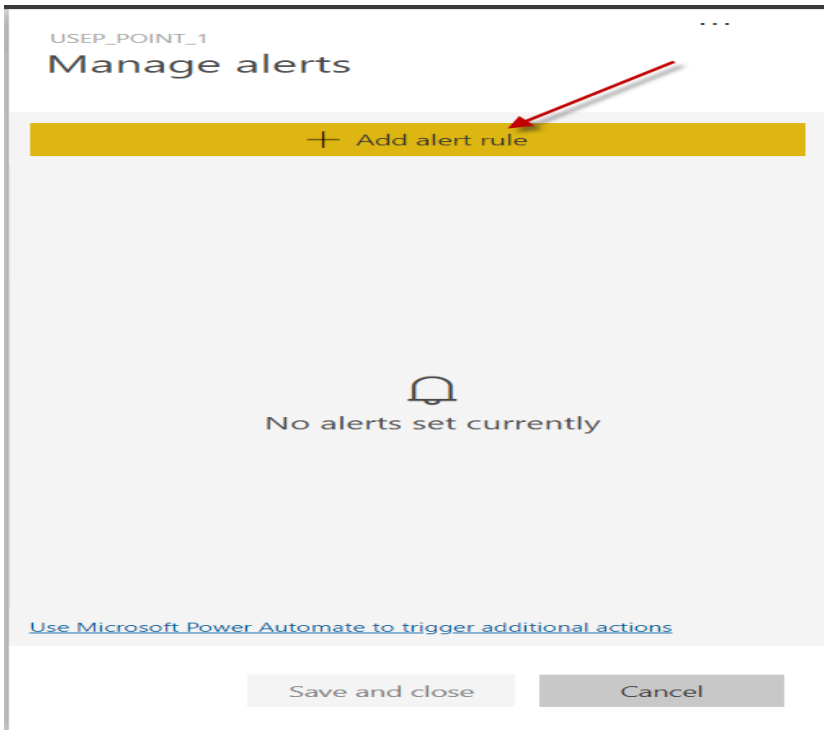
Make sure it shows the USEP_POINT_1 till USEP_POINT_5

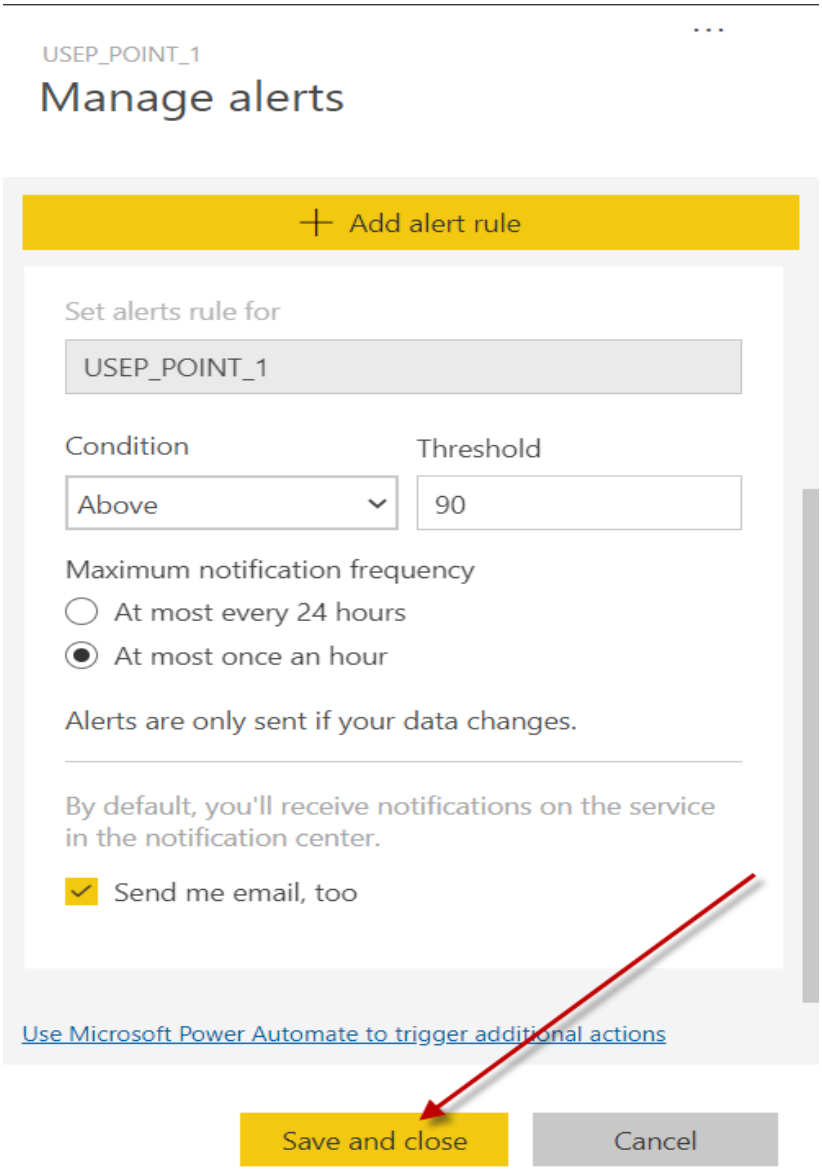


4. Create Alerts in Power BI Dashboard for Each Tile

From the Power BI Dashboard, create alert for each tile (USEP_POINT_1 to USEP_POINT_5)

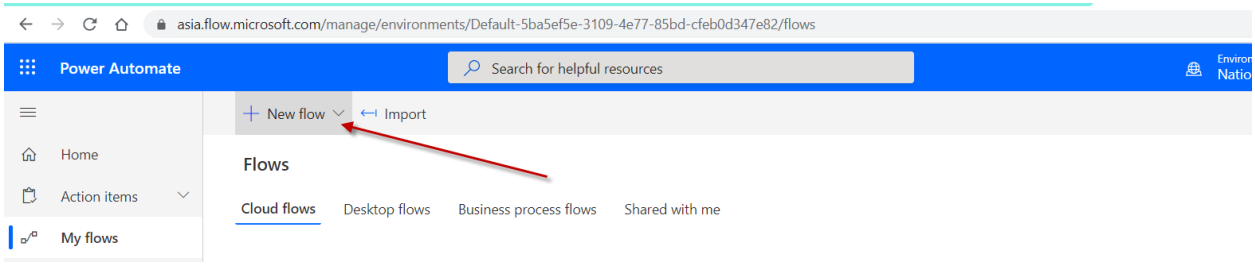

File
Share
Chat in Teams
Comment
Subscribe
Edit
Ask a question about your data
USEP_POINT_1
103.16
USEP_POINT_2
USEP_POINT_3
101.09
Add a comment
Chat in Teams
Copy visual as image
Go to report
Open in focus mode
Manage alerts
Export to .csv
Edit details
View insights
Pin tile
Delete tile

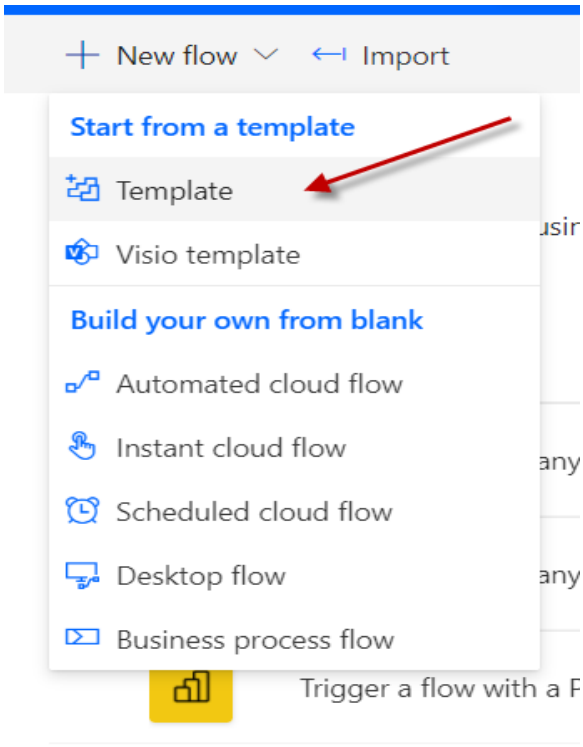

USEP_POINT_1
Manage alerts
Add alert rule
No alerts set currently
Use Microsoft Power Automate to trigger additional actions
Save and close
Cancel



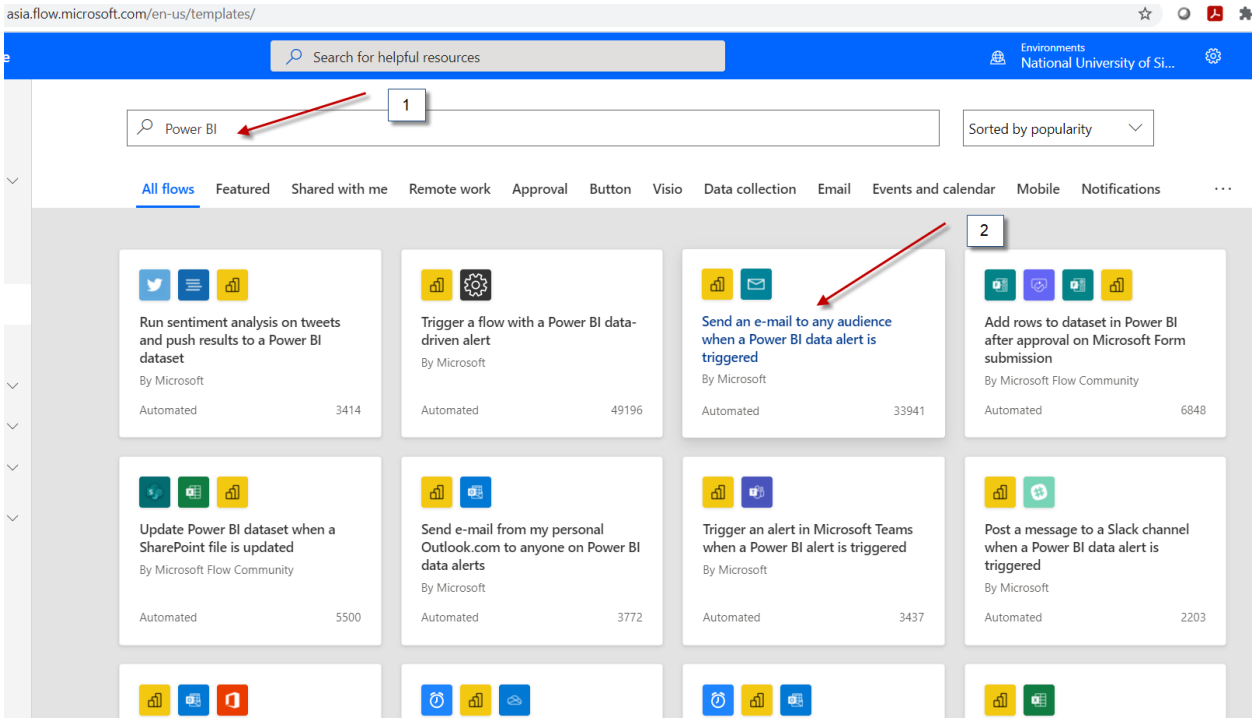
5. Create Flows in Power Automate to generate Outlook Email Based on Power BI Data Alert

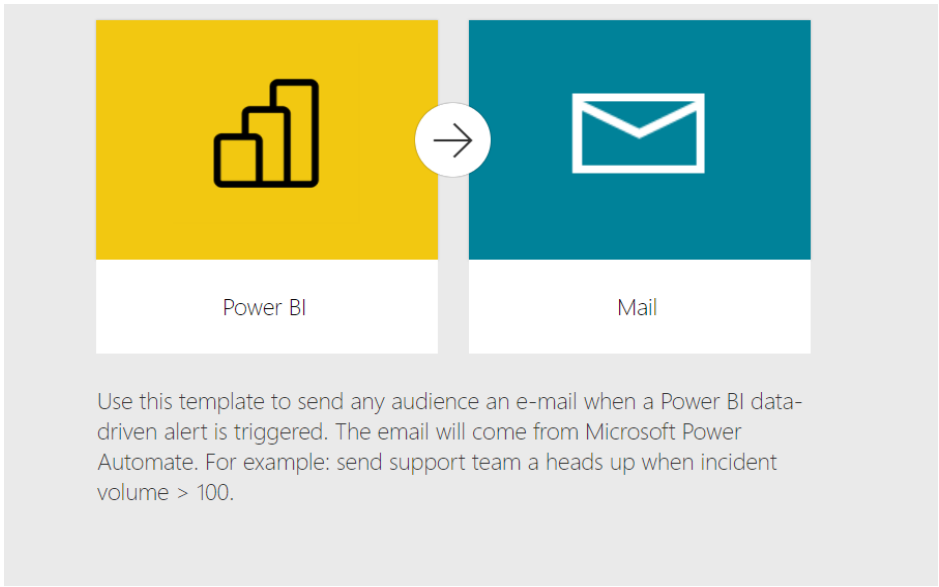
For each data alert that we created in Power BI Dashboard, we need to create the corresponding Power Automate Flow. To do this we need to sign-in into Power Automate (flow.microsoft.com)

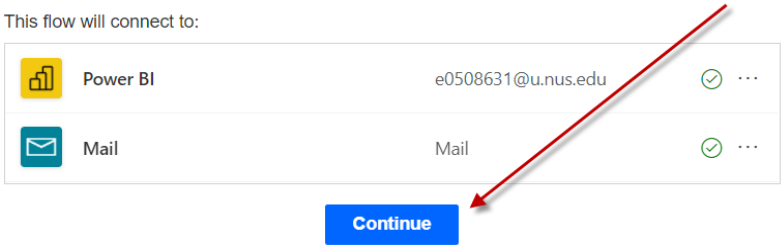




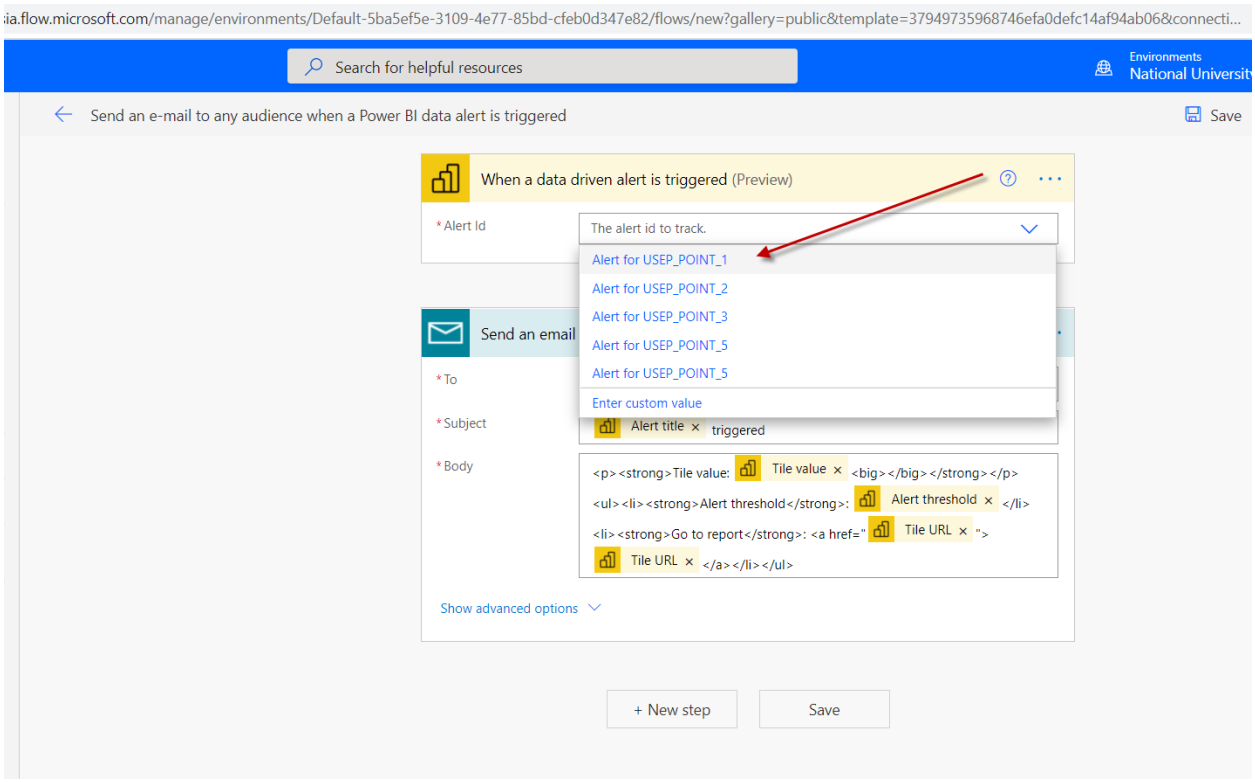
Type “Power BI” in your template search then select “Send an email to any audience when a power bi data alert is triggered”


asia.flow.microsoft.com/en-us/templates/
Search for helpful resources
Environments
National University of Si...
1
Power BI
Sorted by popularity
All flows
Featured
Shared with me
Remote work
Approval
Button
Visio
Data collection
Email
Events and calendar
Mobile
Notifications
2
Run sentiment analysis on tweets and push results to a Power BI dataset
By Microsoft
Automated 3414
Trigger a flow with a Power BI data-driven alert
By Microsoft
Automated 49196
Send an e-mail to any audience when a Power BI data alert is triggered
By Microsoft
Automated 33941
Add rows to dataset in Power BI after approval on Microsoft Form submission
By Microsoft Flow Community
Automated 6848
Update Power BI dataset when a SharePoint file is updated
By Microsoft Flow Community
Automated 5500
Send e-mail from my personal Outlook.com to anyone on Power BI data alerts
By Microsoft
Automated 3772
Trigger an alert in Microsoft Teams when a Power BI alert is triggered
By Microsoft
Automated 3437
Post a message to a Slack channel when a Power BI data alert is triggered
By Microsoft
Automated 2203

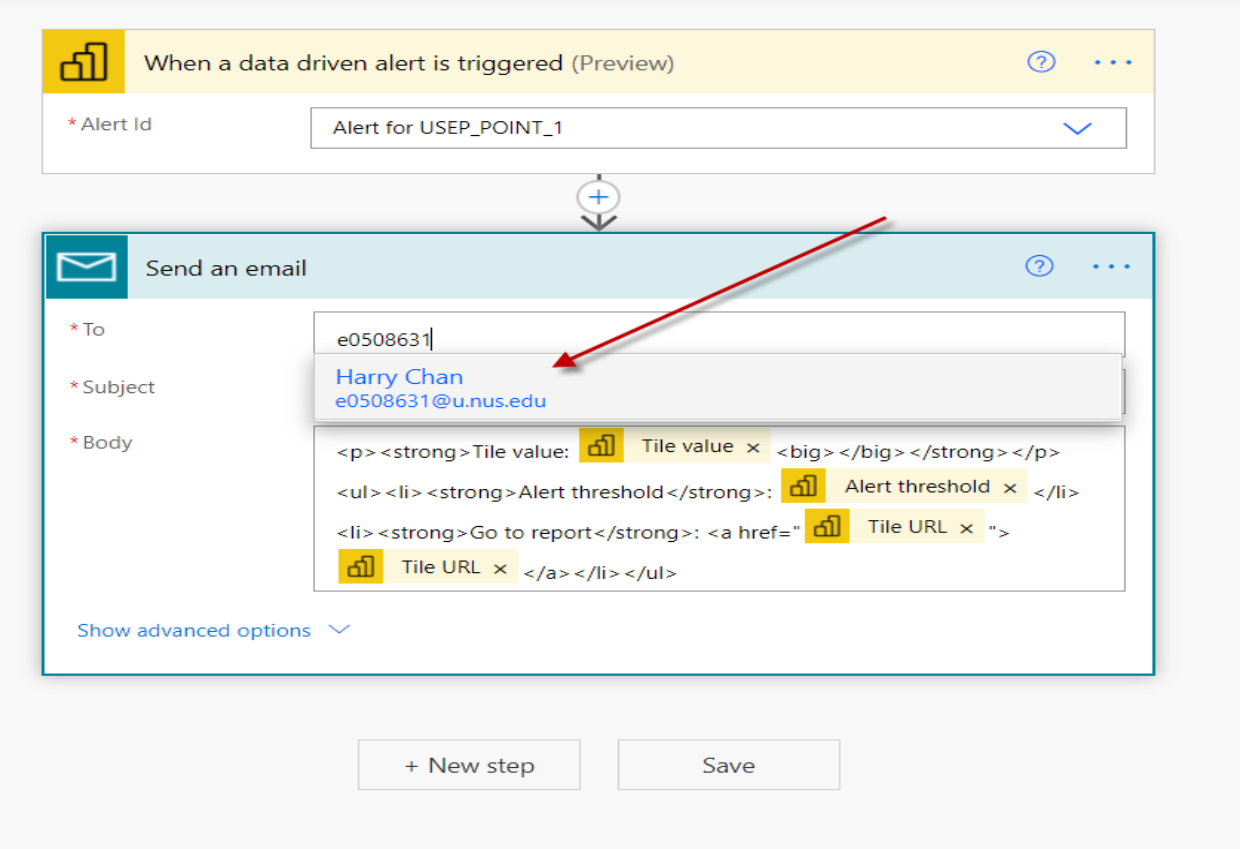

Power BI
Mail
Use this template to send any audience an e-mail when a Power BI data-driven alert is triggered. The email will come from Microsoft Power Automate. For example: send support team a heads up when incident volume > 100.


This flow will connect to:
Power BI
e0508631@u.nus.edu
Mail
Mail
Continue

Select the Power BI alert one by one for each flow (i.e. first flow is for USEP_POINT_1 only)



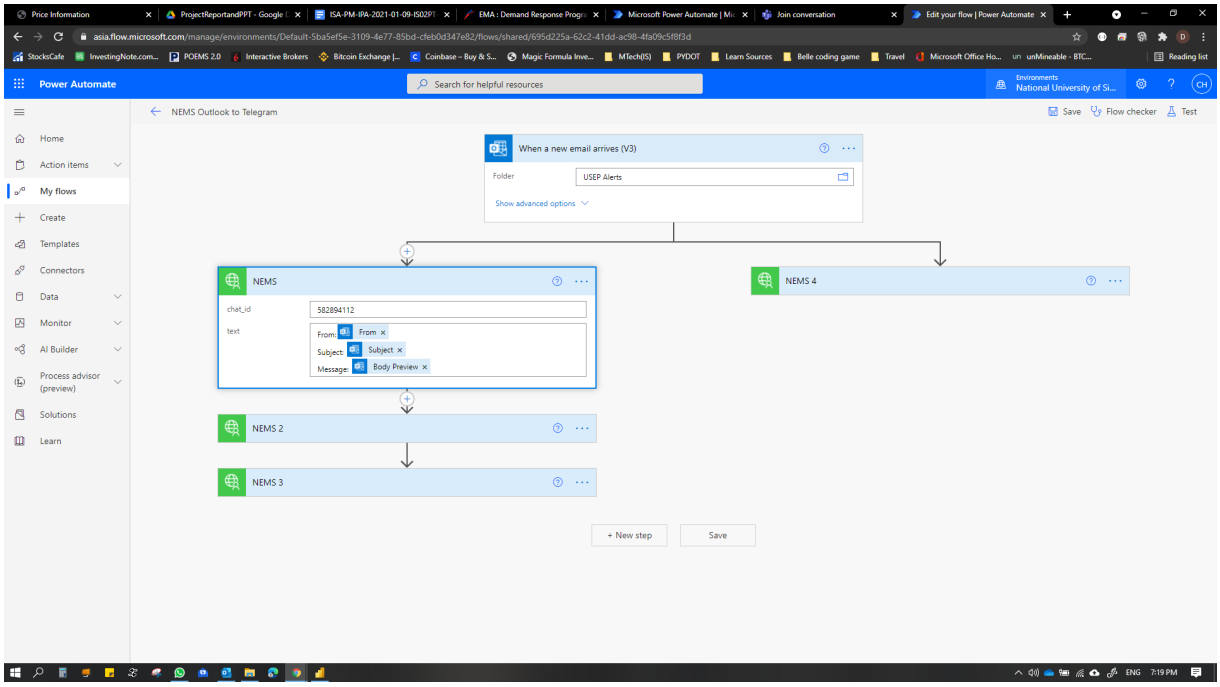
Choose the destination email and customize your email message accordingly. For example since USEP_POINT_1 will happen 1.5 hours from now then you can put the message such as "Hi, the USEP Price 1.5 hours from now is estimated to be xxx which is higher than the threshold level set in the trigger"



6. Create the Power Automate Flow for Telegram Bot notifications

Open the Power Automate Flow and configure the corresponding USEP alerts to the designated Telegram account. The telegram account ID is to be retrieved with the following command.https://api.telegram.org/bot932405442:AAHf-fHe4fKtQ-0GBDJ1cV4Sx4M0o9xDyug/getUpdates

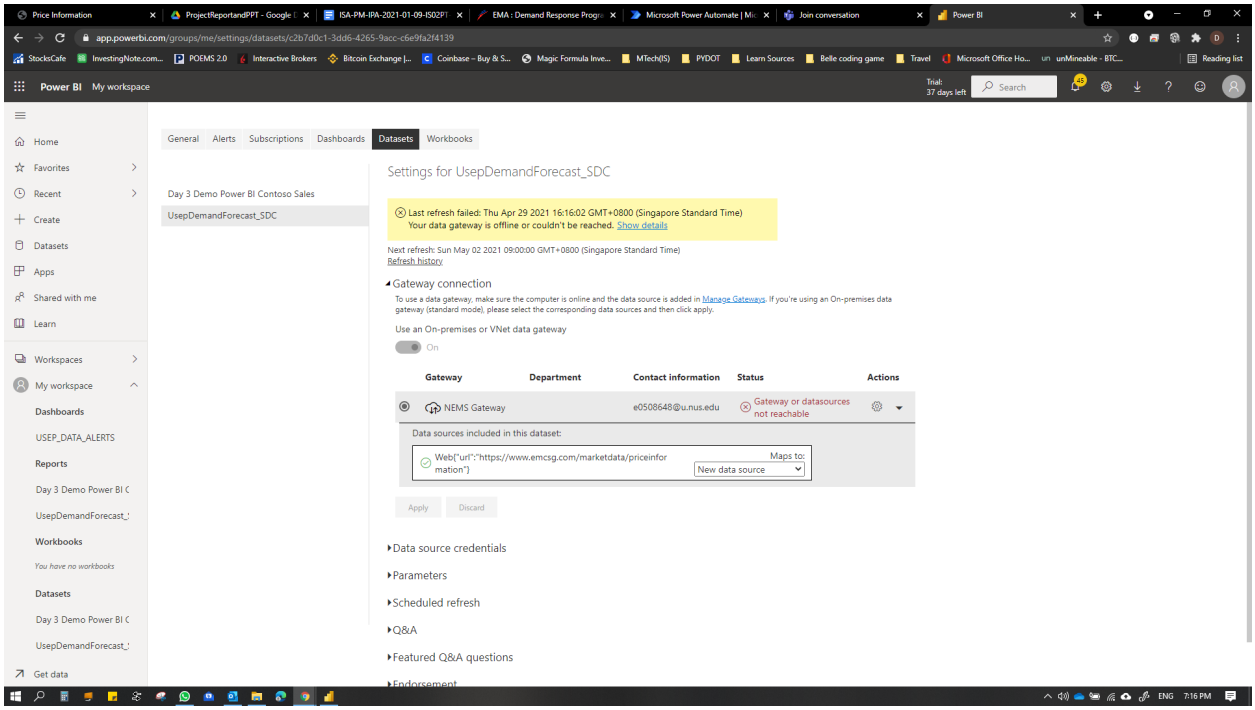
From that data you need to save you chat id ("chat":{"id":389539168"....) as this is the id of your chat that we will use to send notifications from outlook

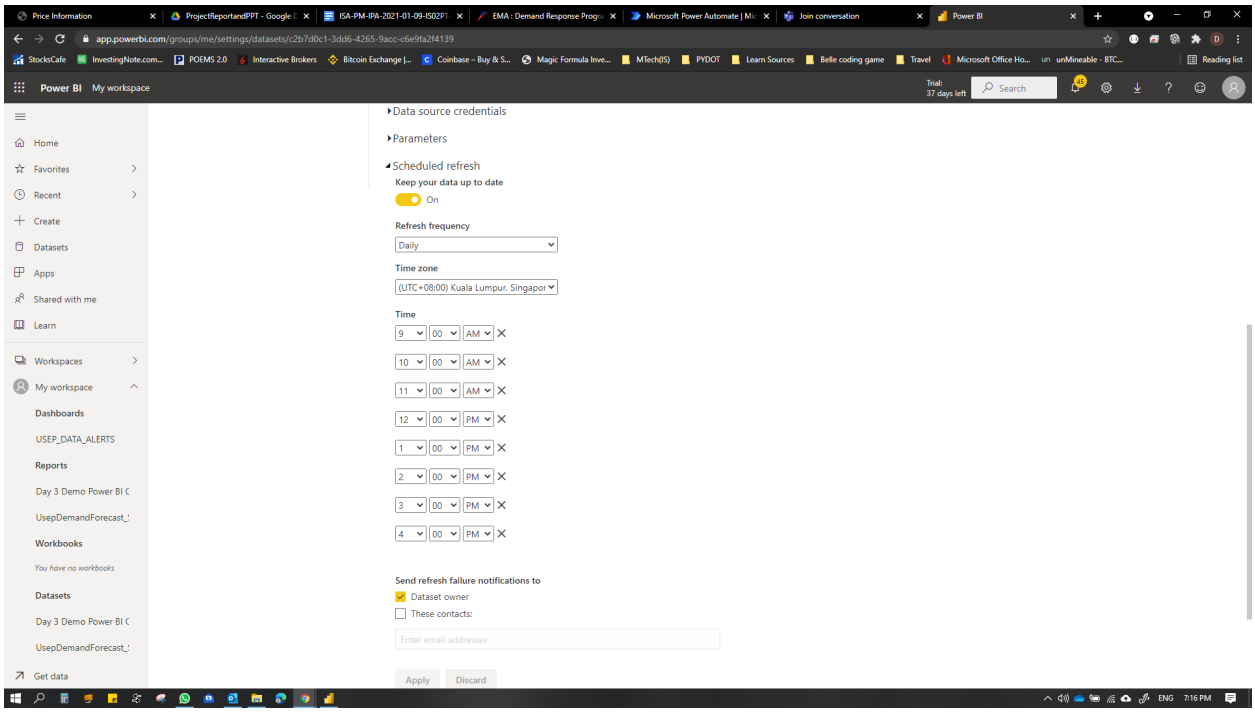


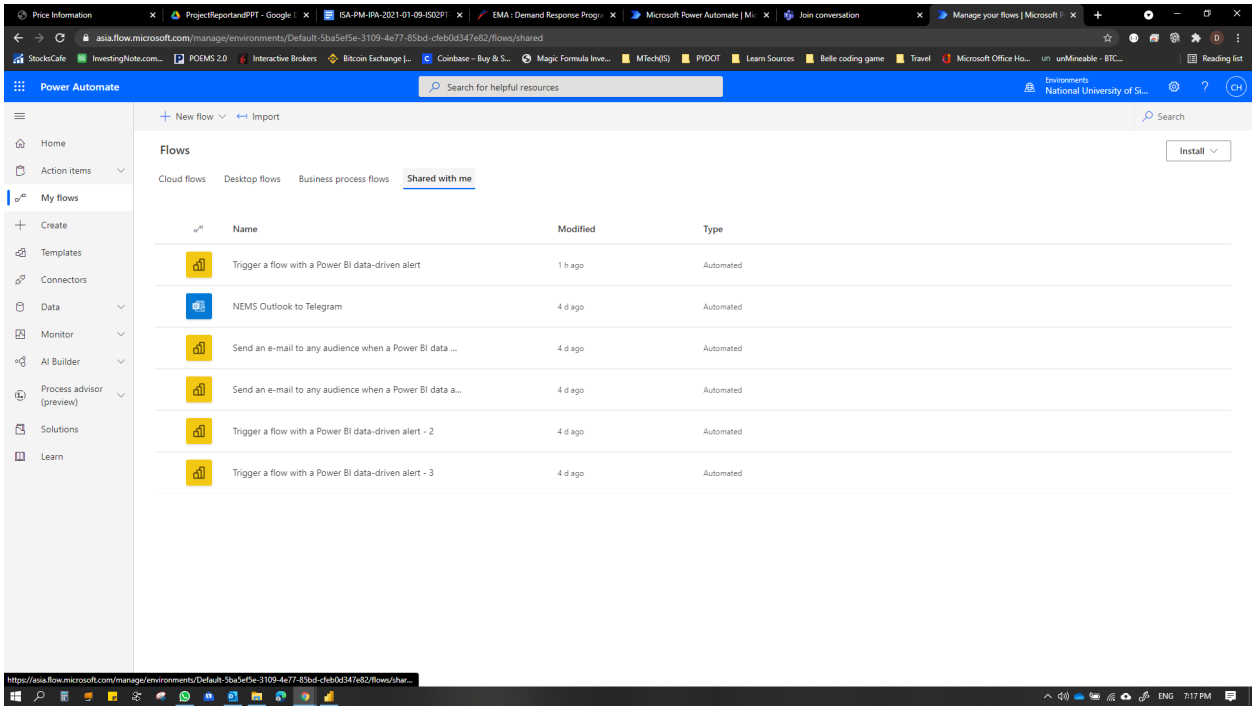
7. Configure Power BI Gateway to schedule refresh for published Power BI data dashboards.

In Power BI, go to “My Workspace” or other workspace where you published your Power BI Report previously. Then select the data set’s settings, and configure an on-prem gateway. This on-prem gateway will act as the link between external data source (in our case it is the EMC website) with the Power BI Cloud.

WIth a on-premise gateway configured, the scheduled refresh for the respective data alerts will be activated.


Power BI
My workspace
General
Alerts
Subscriptions
Dashboards
Datasets
Workbooks
Settings for UsepDemandForecast_SDC
Day 3 Demo Power BI Contoso Sales
UsepDemandForecast_SDC
Last refresh failed: Thu Apr 29 2021 16:16:02 GMT+0800 (Singapore Standard Time)
Your data gateway is offline or couldn't be reached. Show details
Next refresh: Sun May 02 2021 09:00:00 GMT+0800 (Singapore Standard Time)
Refresh history
Gateway connection
Use an On-premises or VNet data gateway
On
Gateway
Department
Contact information
Status
Actions
NEMS Gateway
e0508648@u.nus.edu
Gateway or datasources not reachable
Data sources included in this dataset:
Maps to:
New data source
Apply
Discard
Data source credentials
Parameters
Scheduled refresh
Q&A
Featured Q&A questions
Endorsement


Power BI
My workspace
Data source credentials
Parameters
Scheduled refresh
Keep your data up to date
On
Refresh frequency
Daily
Time zone
(UTC+08:00) Kuala Lumpur, Singapor
Time
Send refresh failure notifications to
Dataset owner
These contacts:
Enter email addresses
Apply
Discard



8.Python setup for Power BI

In order to use Python in the Power BI, please install Python 3 from https://www.python.org/downloads/ we recommend to not use Python with Anaconda and instead please install Python to the local system.

Please place the DemandForecastData.xlsx file into the root folder of D drive, if not applicable, please open the script get_uesp.py and change the variable 'filename' to the corresponding file path of the data file.

Also for Windows users please make sure that there is no spacing in the user folder in C drive, for example: 'C:\Users\JackChan' instead of 'C:\Users\Jack Chan' otherwise the TagUI will run into error.

Please install below packages with the Python:

pip install pandas

pip install matplotlib

pip install openpyxl

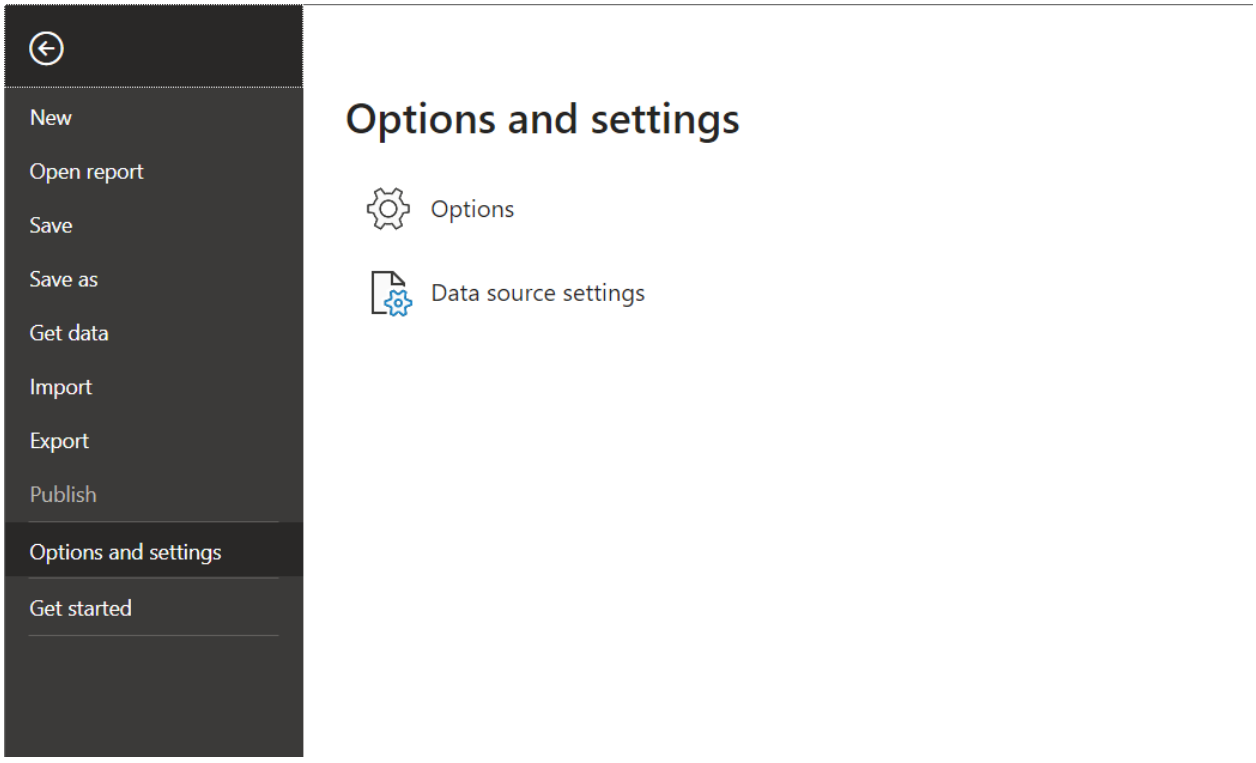
pip install -U scikit-learn

pip install statsmodels

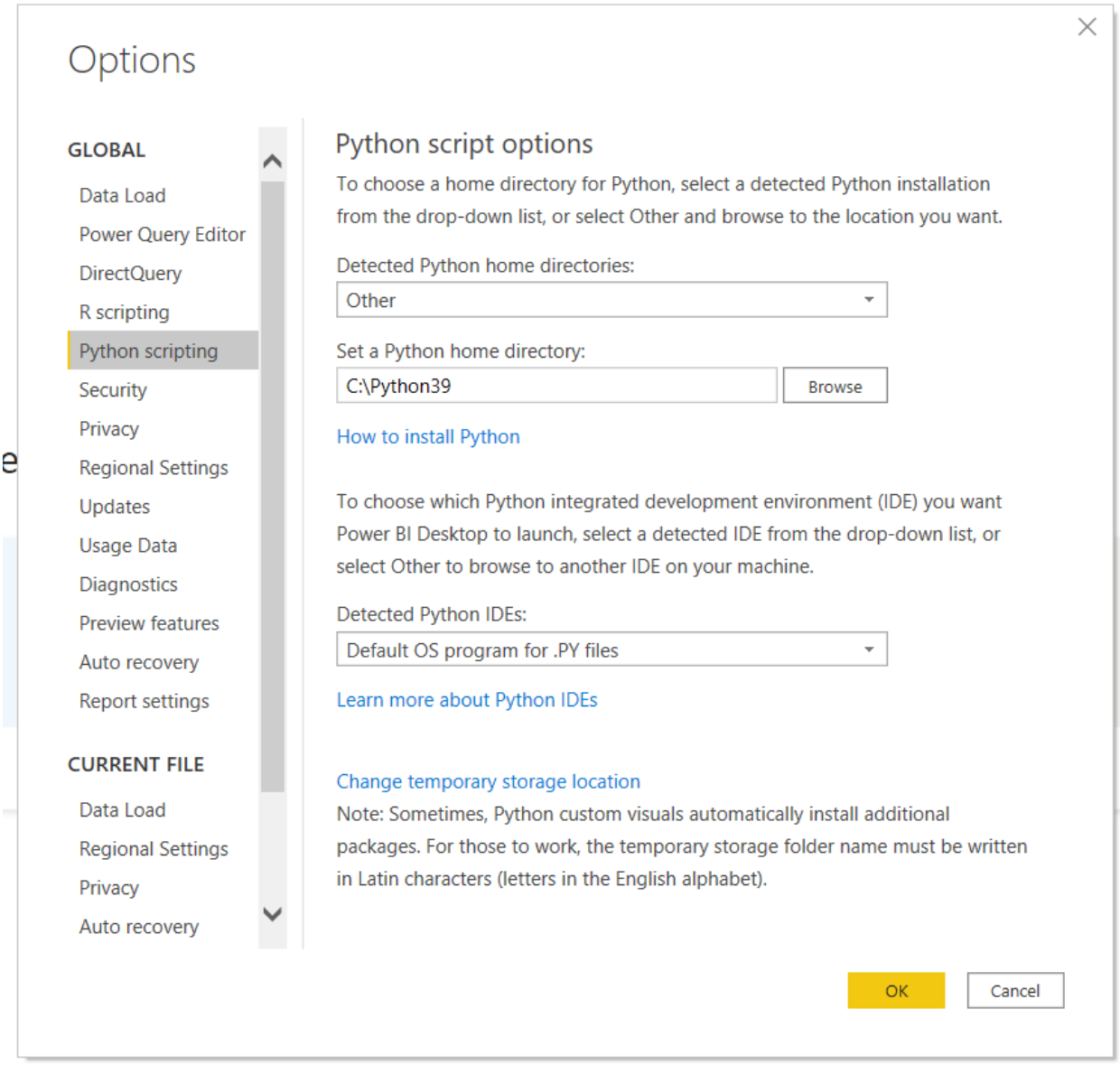
pip install xlrd

pip install rpa

Then in the Power BI, go to File, click on Options and settings and then click Options



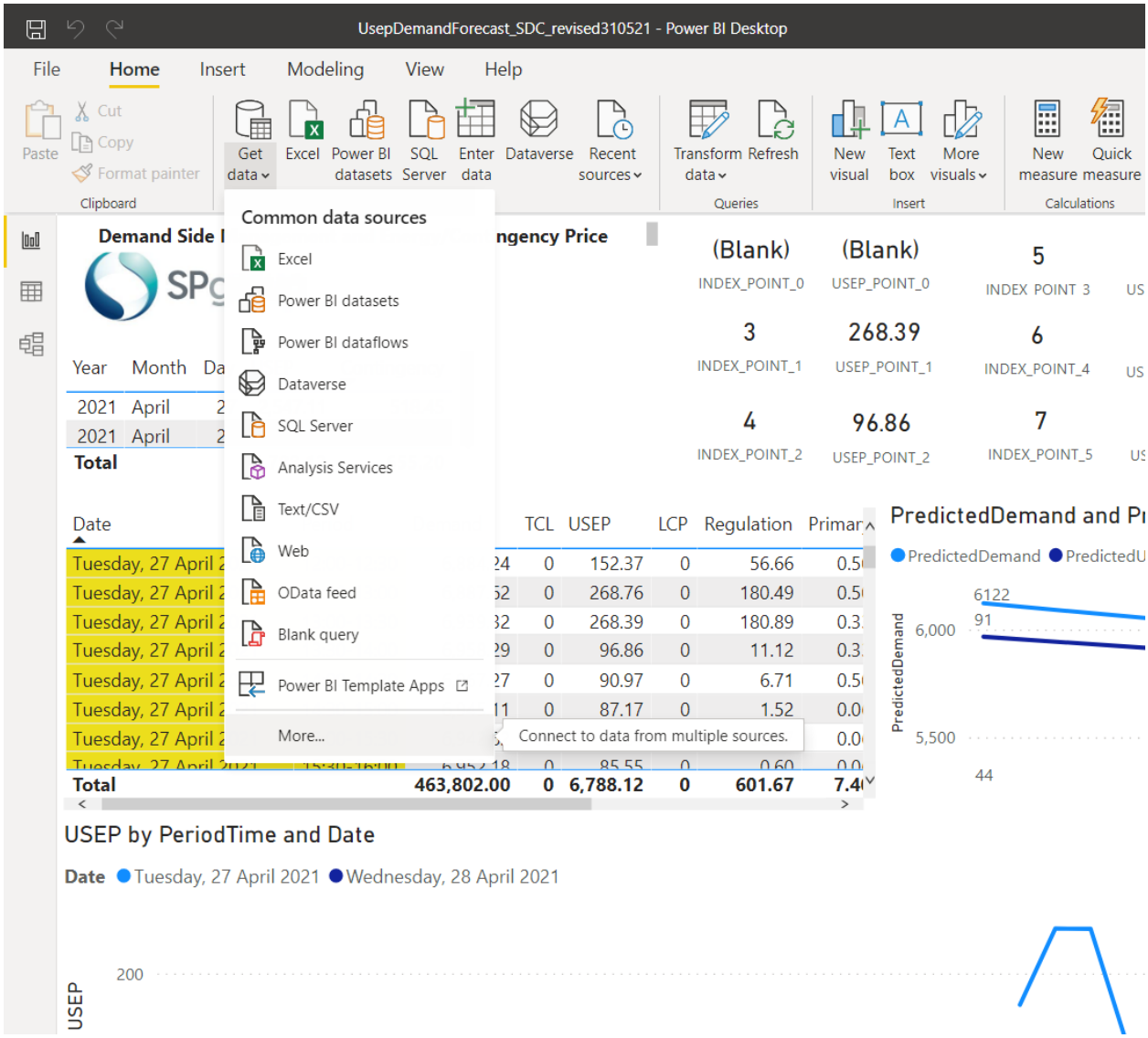
Go to Python scripting, set the Python home directory to your Python path and click OK.



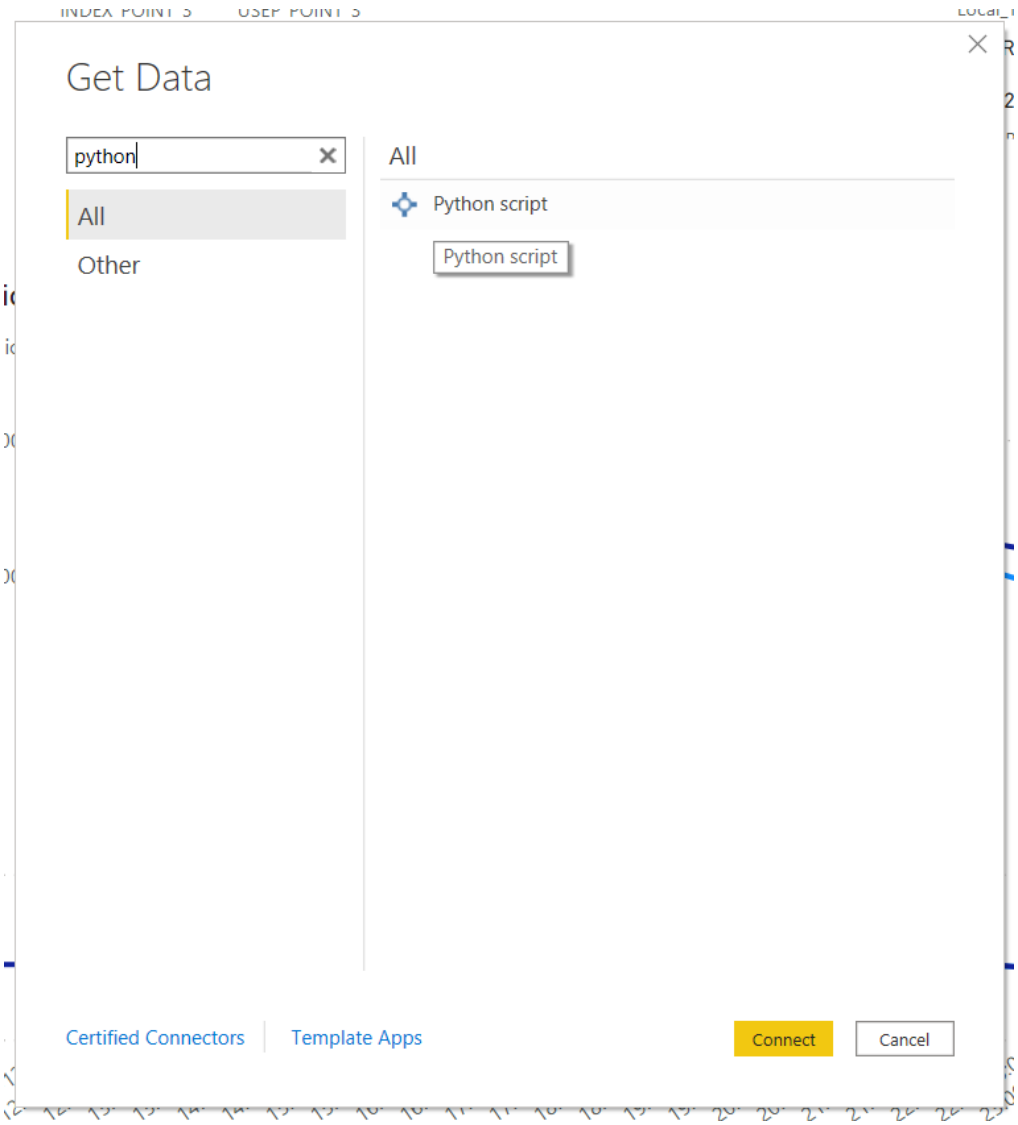
9. Adding the Python script into Power BI

In the pbix file provided, the Python script is already incorporated to the Power BI program, below are the steps if the user wishes to import the Python program to Power BI manually

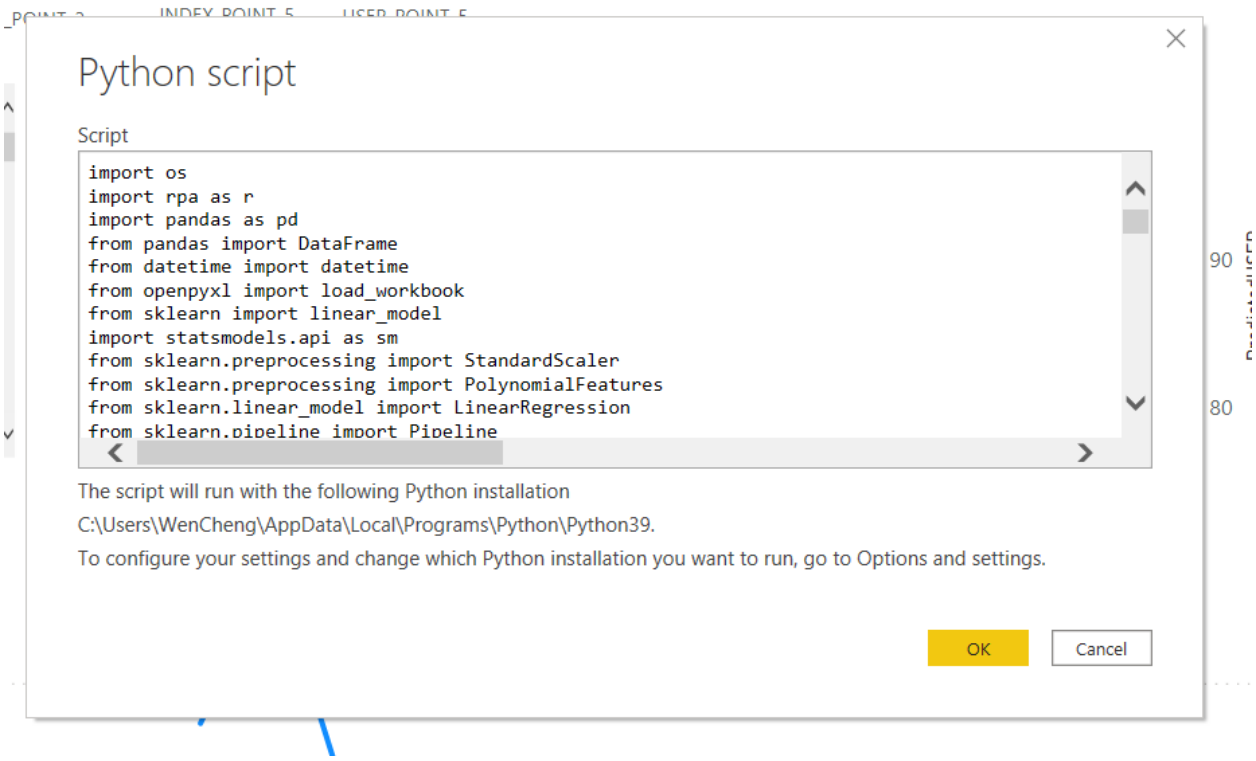
Go to Get data and expand the menu and then click More:



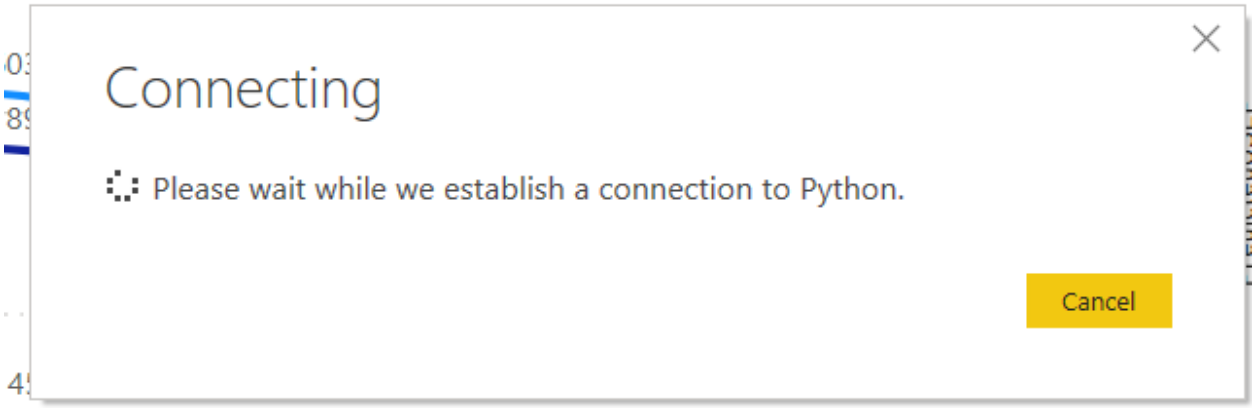
Search for Python and double click on ‘Python script’



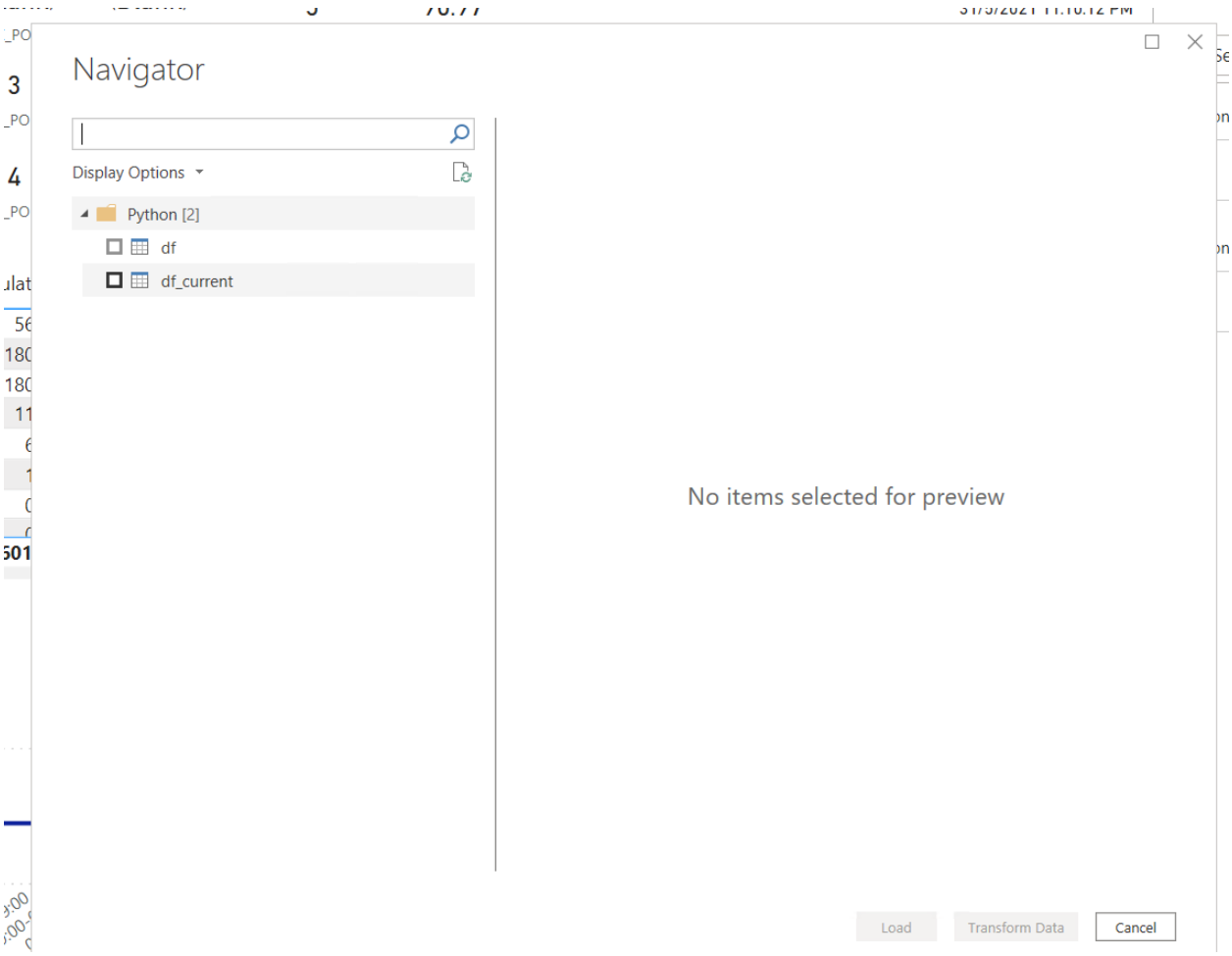
Copy and Paste the Python script into the dialogue box and click Ok

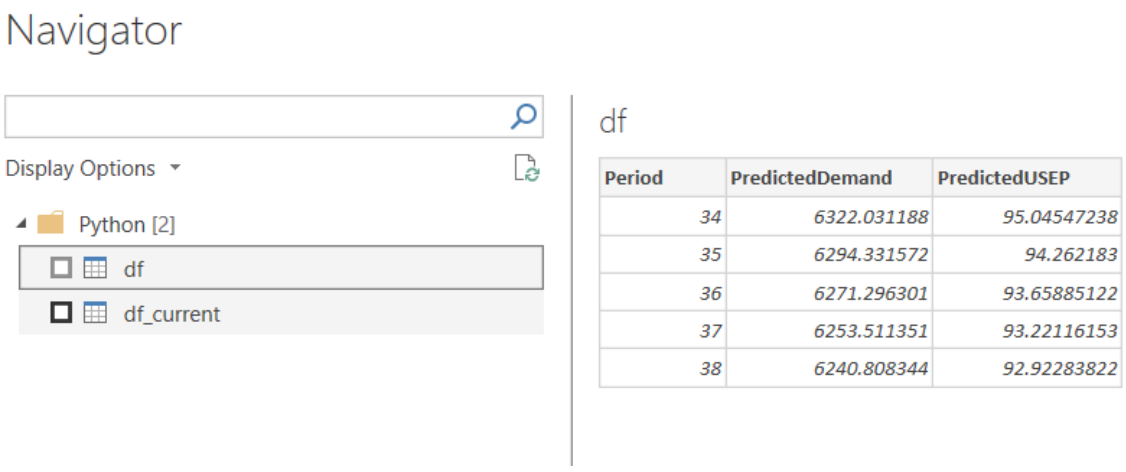


The program should be executing and there will be several Chrome window pop up as the TagUI is running



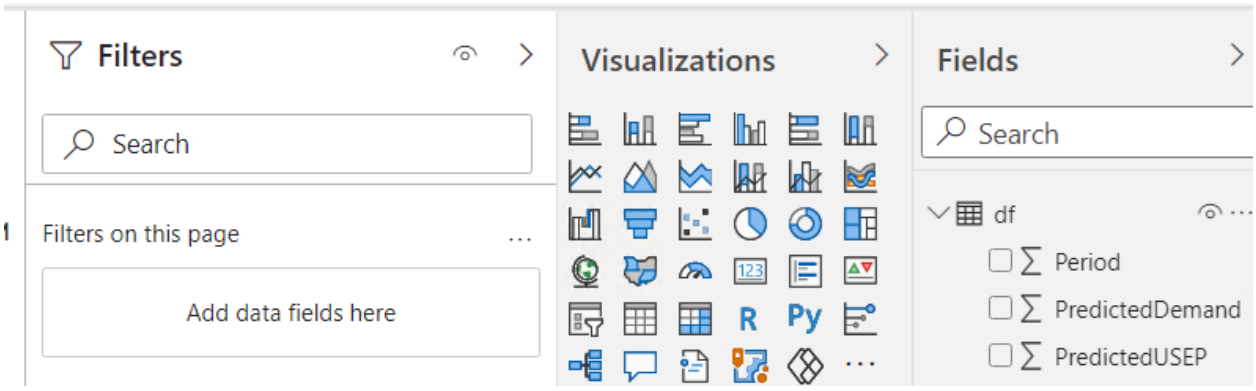
After the below screen is shown, means the data source has been configured successfully, df is the prediction for the next 5 periods and df_current is the current data. User can then add the data source into the Power BI file.





Period	PredictedDemand	PredictedUSEP
34	6322.031188	95.04547238
35	6294.331572	94.262183
36	6271.296301	93.65885122
37	6253.511351	93.22116153
38	6240.808344	92.92283822

df will appear at the side bar


Filters
Search
Filters on this page
Add data fields here
Visualizations
R
Py
Fields
Search
df
Period
PredictedDemand
PredictedUSEP