

Guide for using the PtX-Bornholm operation tool

- The tool is developed by researchers from DTU Wind and Energy system in 2023 for calculating production of hydrogen and waste heat from a wind-driven multi-electrolyser system.
- The tool receives financial support from REACTRF-22-0054 – “Feasibility study for Power-to-X production on Bornholm” which is a project funded by the European Regional Development Fund and Danish Board of Business Development.

Content of the tool

- The tool contains three files as following

i) Wind power data could be read from "SP379-HH100_2016_1hour.txt", which gives hourly wind power data for a 1GW offshore wind farm and can be scaled if relevant.

ii)"Function" is used to calculate the voltage and current for a single electrolyser stack.

iii)"Main" is used to calculate the hydrogen production and recovered heat amount of multi module electrolysers. In this file, a particular operation strategy is developed, i.e., "sequential operation", to operate multiple-electrolyser units.

Before running

- Please download Matlab from the following website

<https://ww2.mathworks.cn/downloads>

The screenshot shows the MathWorks website's download page for R2023a. The page features a blue header with the MathWorks logo and a 'Download' button. Below the header, there are navigation links for 'Frequently Asked Questions', 'Installation and licensing assistance', and 'Contact support'. The main content area is divided into three columns. The left column, titled 'Select a version', lists 'R2023a' (selected), 'R2022b', 'R2022a', and 'Show more'. The middle column, titled 'R2023a', includes a dropdown menu 'I'm going to:' set to 'Install the product' and a large blue button labeled 'Download the version of Windows (233 MB)'. Below this button, it states 'Includes R2023a Update 5' and 'Released version: 2023 8 10'. The right column, titled 'About R2023a', contains links for 'Latest features', 'Release Notes', and 'System requirements'. At the bottom right, there is a section for 'R2023b Prerelease' with a 'Get R2023b Prerelease' link. A red rounded rectangle highlights the 'Download the version of Windows (233 MB)' button and the text below it.

Before running

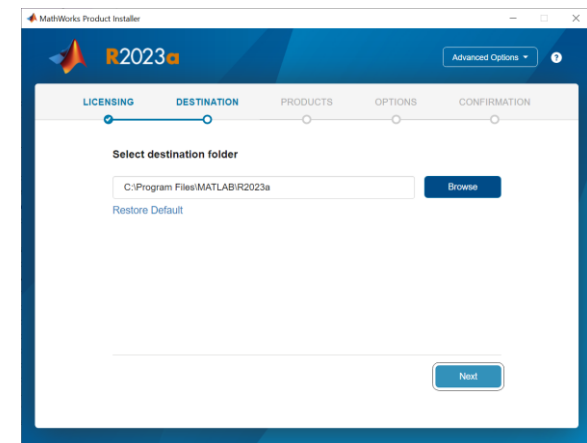
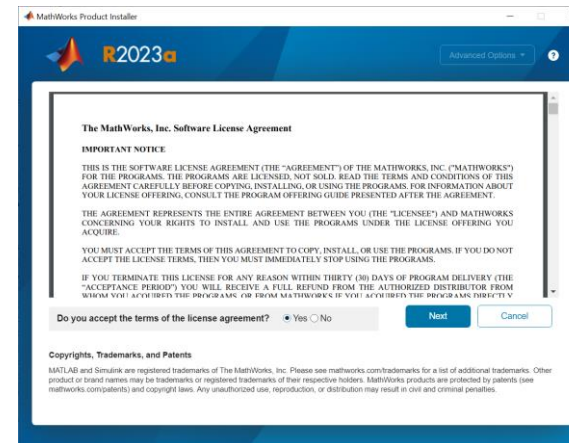
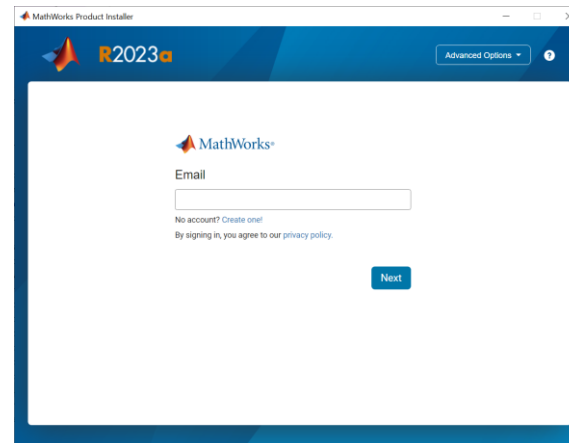
- Install Matlab

Double-click the matlab_R2023a_win64.exe installer file to launch the installer

 matlab_R2023a_win64 11-09-2023 16:12 Application 238.934 KB

When asked if you want to allow the application to make changes, answer Yes.

Name	Date modified	Type	Size
archives	11-09-2023 16:12	File folder	
bin	11-09-2023 16:12	File folder	
celclient	11-09-2023 16:12	File folder	
extern	11-09-2023 16:12	File folder	
remote	11-09-2023 16:12	File folder	
resources	11-09-2023 16:12	File folder	
ui	11-09-2023 16:12	File folder	
utils	11-09-2023 16:12	File folder	
autorun	16-06-2006 15:50	Setup Information	1 KB
installer_input	22-02-2023 18:05	Text Document	9 KB
license_agreement	31-01-2023 08:53	Text Document	81 KB
mathworks_installation_help	04-07-2023 02:23	Microsoft Edge PDF ...	739 KB
mathworks_installation_help_es	13-06-2023 03:29	Microsoft Edge PDF ...	747 KB
mathworks_installation_help_ja_JP	31-05-2023 19:23	Microsoft Edge PDF ...	638 KB
mathworks_installation_help_ko_KR	31-05-2023 19:23	Microsoft Edge PDF ...	754 KB
mathworks_installation_help_zh_CN	31-05-2023 19:23	Microsoft Edge PDF ...	874 KB
readme	22-02-2023 18:05	Text Document	9 KB
setup	17-01-2023 10:20	Application	509 KB
uninstall	28-07-2023 19:02	WinRAR ZIP archive	48.997 KB
VersionInfo	24-07-2023 19:15	XML Document	1 KB

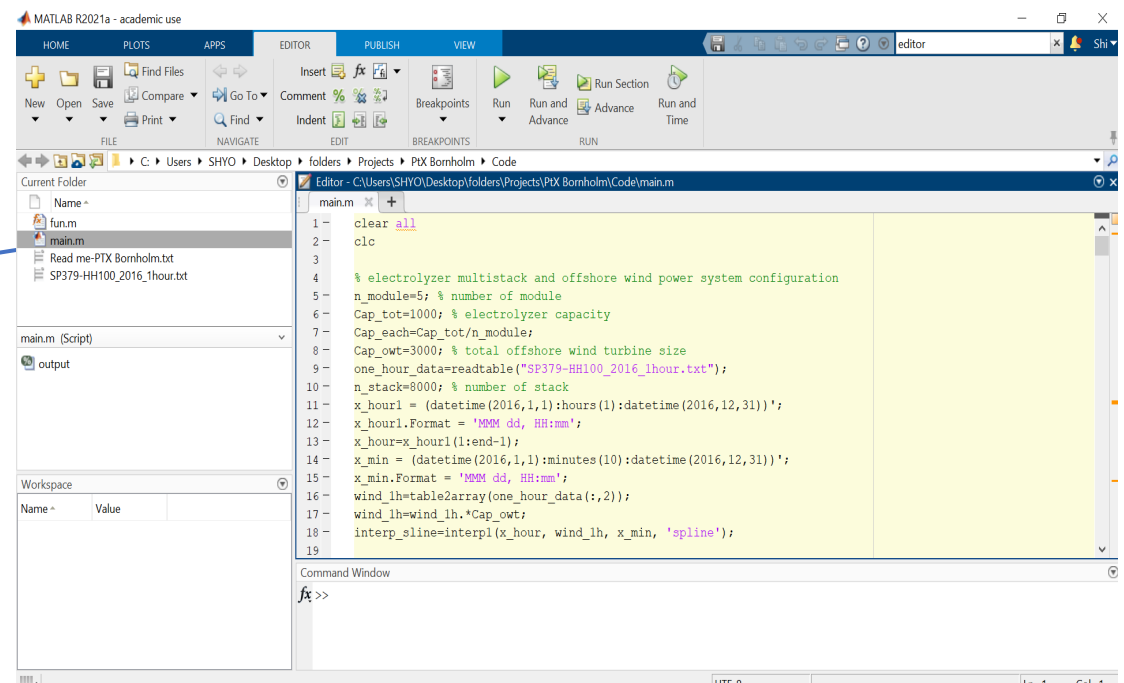
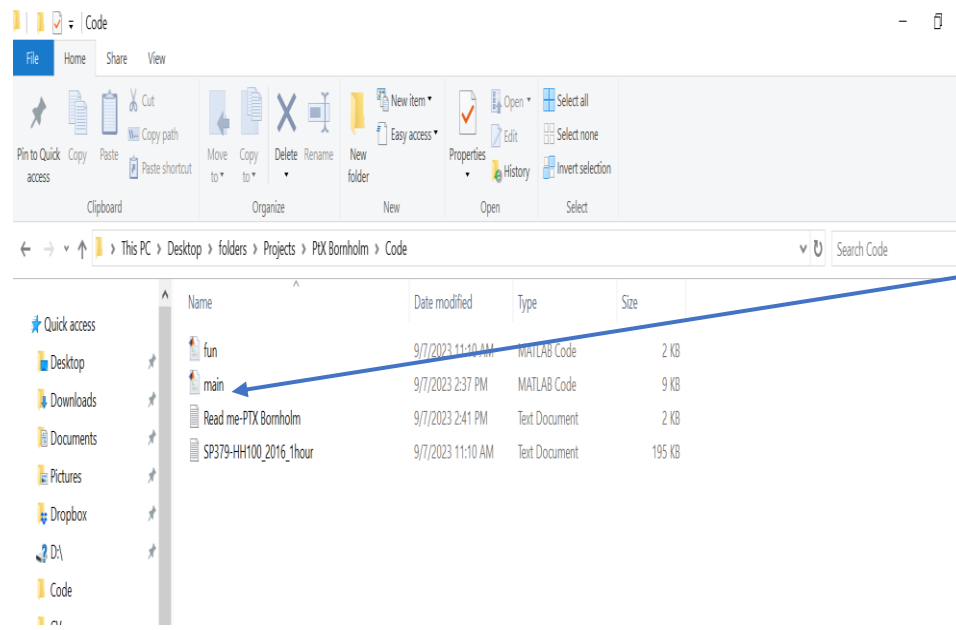


If your computer has been configured to use a proxy server for Internet access, enter the user name and password to continue with a standard installation.

Contact your system administrator for proxy server credentials.

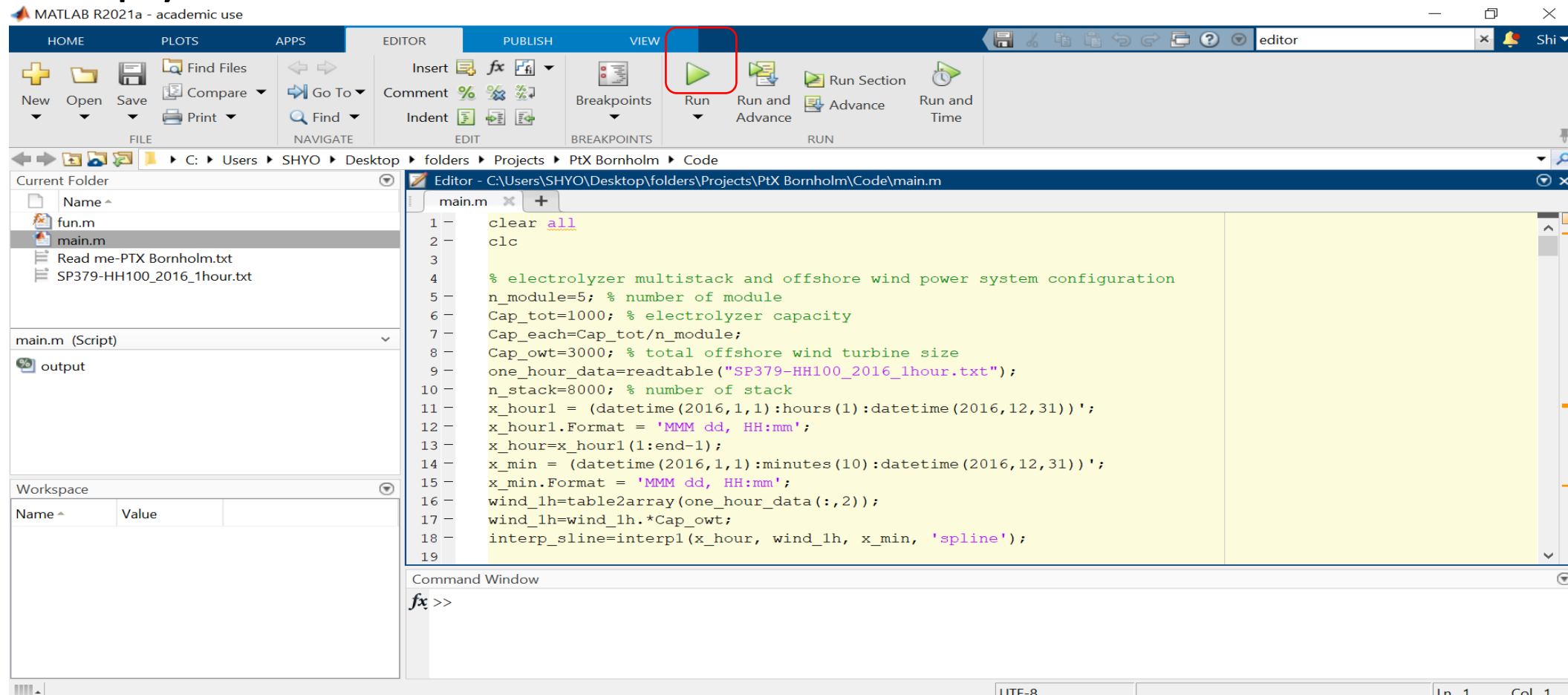
Load the file

- When you run the code, please save all documents in the same path, then simply open "Main" file in the matlab enviroment.



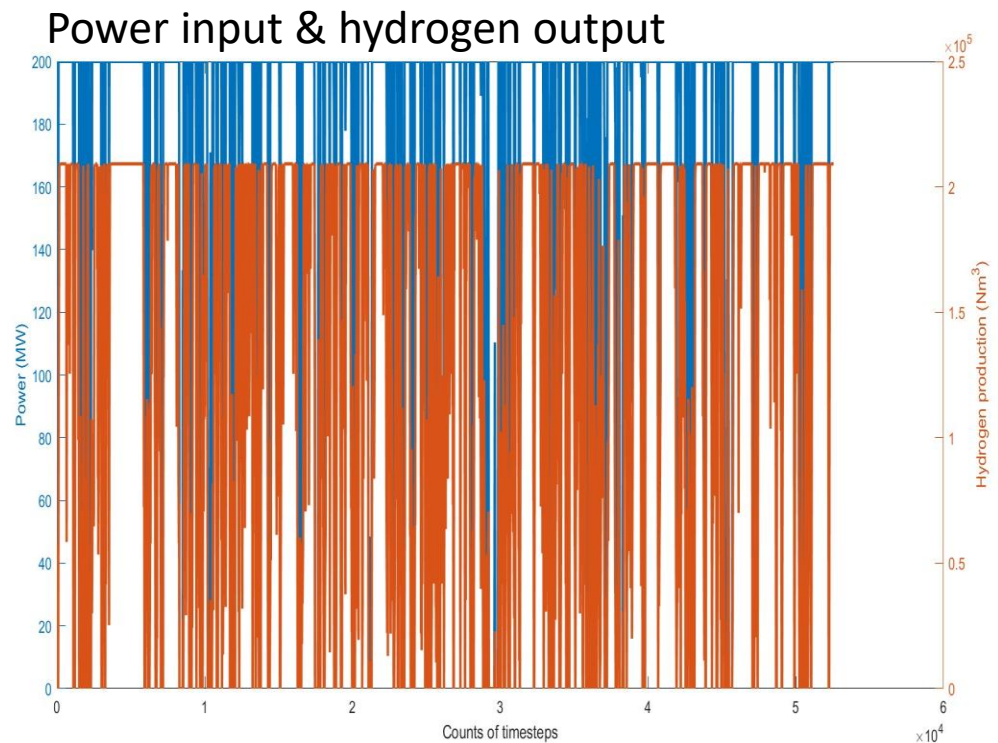
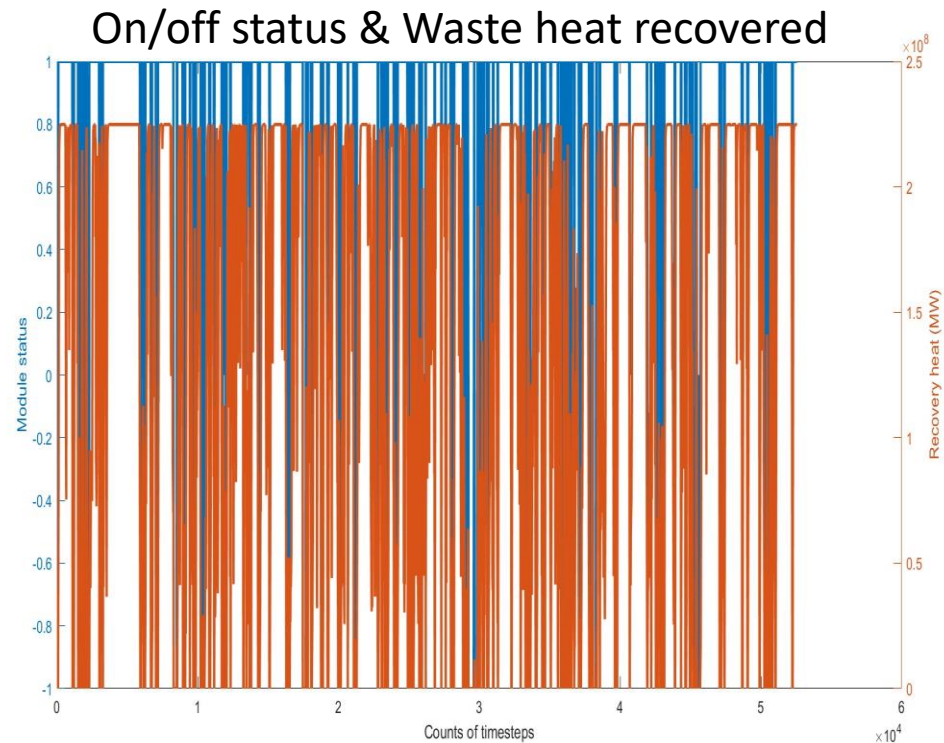
Run the code

- Simply click the “run” button.



See/plot results

- The results can be plotted after running the code. Figures below illustrate the operation performance of a single electrolyser module over a year with a time resolution of 10 mins.



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- The default case simulates operation of a 1GW electrolyser system that is directly powered by a 3GW offshore wind farm. The 1GW electrolyser system contains 5 electrolyser modulers, each of which has a nominal power capacity of 200MW.
- Users can adjust input data, e.g., the wind profile, and parameters of the electrolyser system, e.g., capacity, modular size, operation temperature....., according to own needs.
- Additional information about the principle applied can be found in project deliverable “WP4: Integration of Power-to-X into Bornholm’s energy system”- V20200830”.

For any further support/collaboration, please reach out to
shyo@dtu.dk