



# THERMOS

Accelerating the development of low-carbon  
heating & cooling networks in Europe

THERMOS Train-the-Trainer Certification Programme  
Instructor Led - Webinar No. 1

**Energy system mapping and modelling with THERMOS**





# Welcome to the THERMOS Capacity and Train-the-Trainer Certification Programme!

## Agenda for Today

**16:00 – 16:10** Welcome and Programme Introduction (*by Daniela Torres – ICLEI*)

**16:10 – 16:45** Energy System Mapping & Modelling (*by Martin Holley and Tom Hinton – CSE*)

**16:45 – 17:00** Q&A from participants (*Moderation by ICLEI*)



# THERMOS in a nutshell



- EU Horizon 2020 funded research project (2016 – 2020)
- provides advanced energy system data and models in a **user-friendly open-source software** to make heating and cooling network planning faster, more efficient, and more cost effective.



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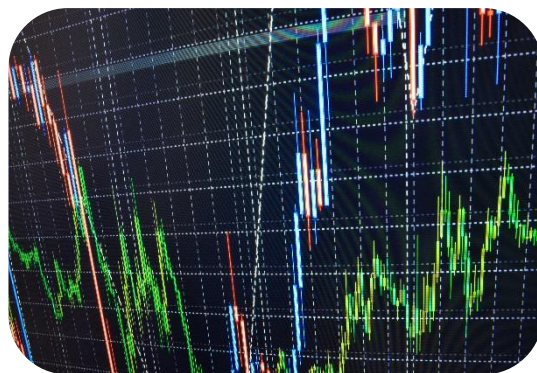


# THERMOS – Thermal Energy Resource Modelling and Optimisation System

An open-source software designed to:



optimise local district  
energy network  
planning processes



support sustainable  
energy master  
planning

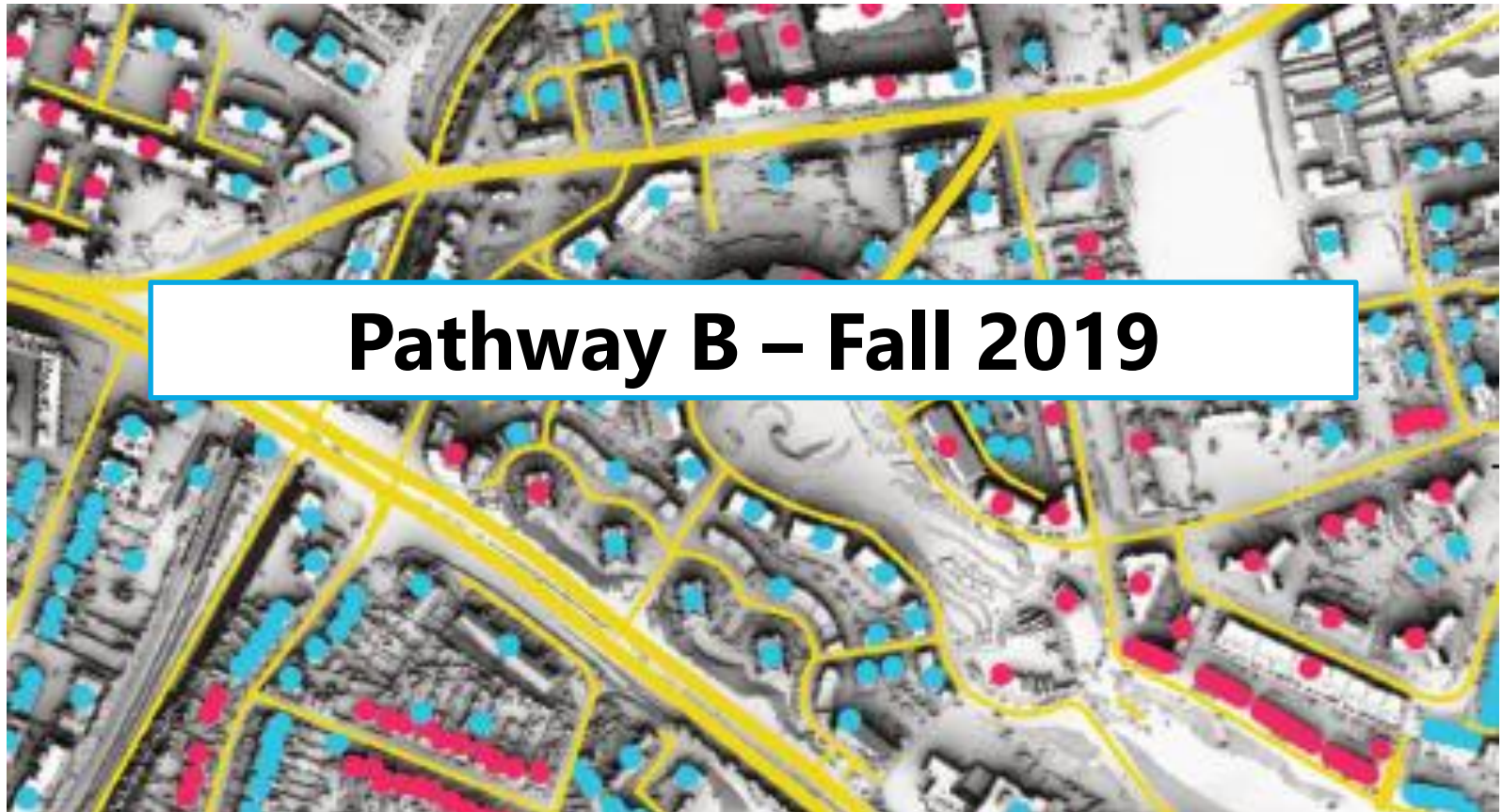


identify and select low-  
carbon heating options  
in real geographies





# THERMOS Train-the-Trainers Programme



## TtT Pathway B Certification Programme structure and methods

Certificate of  
Completion at the end!

Trainers are  
encouraged to  
participate in the TtT  
Workshop in Berlin  
6-Dec-2019



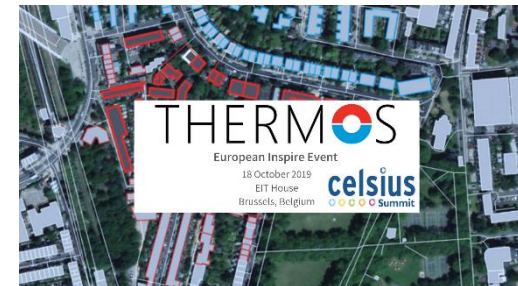
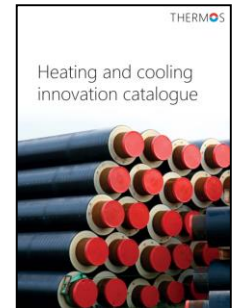
THERMOS TtT Certification Prog.

Method	Module / Content
<p>3 Instructor-Led Webinars.</p> <p><i>Hands on with THERMOS tool.</i></p> <p><i>Every 2 weeks</i></p>	<p>Webinar 1: Kick-off &amp; energy system mapping and modelling with THERMOS. <b>Sept 24<sup>th</sup>, 2019 - CET</b></p> <p>Webinar 2: Embedding THERMOS in your city. <b>October 8<sup>th</sup>, 2019 – 16:00 CET</b></p> <p>Webinar 3: Optimizing thermal planning, resources and technologies with THERMOS <b>Oct 22<sup>nd</sup>, 2019 – 16:00 CET</b></p> <p><i>Dedication: 1 to 1:30 hours per webinar</i></p>
<p>Supporting material 3 Recorded Webinars</p> <p><i>Dedication: 1:15 hours per webinar and questionnaires' response</i></p>	<p>Recorded Webinar 1: Thermal energy supply and demand in Europe.</p> <p>Recorded Webinar 2: Heating and cooling market and finance</p> <p>Recorded Webinar 3: Local stakeholders involvement for adopting THERMOS</p> <p><i>+ Follow-up Questionnaire</i></p>
<p>Self-study <i>Dedication: 4 – 6 hours</i></p>	<ol style="list-style-type: none"> <li>1. Innovation catalogue</li> <li>2. THERMOS User Manual</li> <li>3. Scientific Publications</li> </ol>
<p>Case Study</p> <p><i>Dedication: 6 -8 hours</i></p>	<p>Select your preferred option!</p> <ol style="list-style-type: none"> <li>1. THERMOS tool guided exercise</li> <li>2. THERMOS tool case study development</li> </ol>



# THERMOS Train-the-Trainer Certification Programme - News

- ✓ Recommended reading and study before next webinar
  - **Recorded webinar 1 + Q&A on Thermal energy supply and demand in Europe.**
  - Explore the THERMOS tool at <https://tool.thermos-project.eu/login?redirect-to=/>
  - THERMOS Innovation Catalogue **New!**
    - <https://www.thermos-project.eu/resources/publications/>
- ✓ Upcoming Instructor-led **Webinar 2: Embedding THERMOS in your city. October 8th, 2019 – 16:00 CET** (Introduction to final exercise)
- ✓ THERMOS Inspire event @ CELSIUS Summit 2019 - October 18, 2019. ([EIT House](#) - Rue Guimard 7, 4th floor, 1040 Brussels, Belgium)
- ✓ Workshop in Berlin (6<sup>th</sup> of December, 2019) - *optional*
  - Tool insights, final exercises presentations & certificate delivery







# **Welcome to the THERMOS Capacity and Train-the-Trainer Certification Programme**

Lets Get Started!

Meet the presenters

Webinar 1

**Energy system mapping and modelling with THERMOS**







## Martin Holley

- Senior Technical Project Manager:  
[Centre for Sustainable Energy](#), UK
- Roles within THERMOS
  - Project Coordinator for THERMOS
  - THERMOS Trainer
  - Support for development and delivery of training materials
- Background
  - Senior Technical Project Manager, Centre for Sustainable Energy (2002-present)
  - Project Engineer, PV Systems Ltd./Energy Environmental Technical Services Ltd. (1999-2002)
  - Environmental Researcher, Corporación Oikos (1996-1997)
  - Test Measurement Engineer, Rolls Royce PLC. (1983-1990)



## Tom Hinton

- Software Developer:  
[Centre for Sustainable Energy](#), UK
- Roles within THERMOS
  - Tool designer and software developer
  - THERMOS Trainer
  - Support on technical deliverables
- Background
  - Software Developer, Centre for Sustainable Energy (2012-present)
  - Scientific Software Engineer, Minimax Labs (2010-12)
  - Contracting Software Engineer to CPFR Solutions (2002-03)



# **THERMOS**

## **Train-the-Trainer Certification Programme**

Webinar 1  
**Energy system mapping and modelling with THERMOS**

**Let's Get Started!**

Please post your questions in the webinar chat





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**Energy system mapping and modelling with THERMOS**



# What is THERMOS?

## Thermal Energy Resource Modelling and Optimisation System

- Open-source web-based planning tool for district energy systems
- Developed in conjunction with target end-users across eight countries
- Aims to set the state-of-the-art standard for district energy system planning





# What is it used for?

thermos-project.eu



- Early-stage planning of district energy systems
- Considers four main use-cases:
  1. Expansion of existing district energy systems
  2. Identifying local energy demands for known energy sources
  3. Optimising networks between known energy sources and demands
  4. Providing optimised solutions when considering energy demand reduction, networked and non-networked system measures

# Who can use it?

- Anyone – it's open-source, but mainly designed for local authorities and other stakeholders involved in district energy system planning
- No specialist knowledge required for basic level of use:
  - THERMOS training resources available along with comprehensive online manual and 'quick-start' guide
  - Intuitive user-interface
- Some GIS experience needed if uploading local datasets



# What do I need to start?

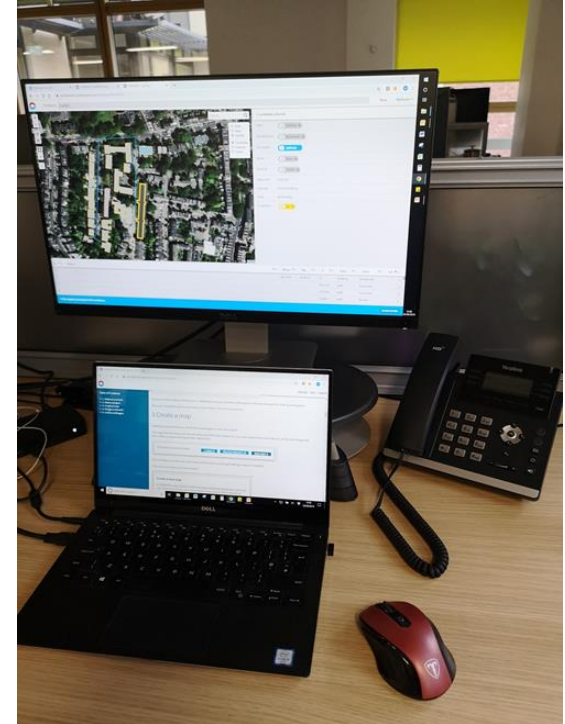


## Basic:

- Standard web browser
- An area of study which is covered by OpenStreetMap (OSM)
- A problem to be solved...

## Supplementary:

- Local datasets for:
  - Building height data (e.g. LiDAR)
  - Building polygons (if not covered by OSM)
  - Energy benchmarks or actual address-level demands
  - Local cost data for energy supply, pipe installation, heat price etc



# Why use THERMOS?

thermos-project.eu



- Developed with a range of local authorities and validated with industry experts
- Browser-based application with fast, easy mapping and automatic heat demand estimation
- Rapid computing of optimised solutions, enabling repeat sensitivity analysis by user-defined supply cost, heat sale price, cost of finance, etc. and so...
- ...enables substantial savings to be made in time and cost of pre-feasibility heat network studies
- Aims to encourage the right thermal networks in the right places, leading to optimised carbon emissions reductions.





## **THERMOS – a brief guided tour:**



<https://tool.thermos-project.eu/>



# **THERMOS**

## **Train-the-Trainer Certification Programme**

Webinar 1

**Energy system mapping and modelling with THERMOS**

Questions and Answers



# THERMOS



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