



## Clean Heat Training program

### General information

**Number of Training Days:** 5 Days

**Duration:** August 17th – August 21st, 2026

**Venue:** Millennium Hilton Bangkok, and School of Energy, Environment and Material, KMUTT, Bangkok

**Scope & Form:** The class is taught on full days from 9:00-17:00. The teaching will be a combination of lectures, Q&A sessions and project work.

**Evaluation:** Pre- and Post-tests, Assignment, Software simulations, and Physical experiments

### Clean Heat Curriculum

#### Day 1 (17<sup>th</sup> August 2026)

##### Module 1: Thermal System Engineering

**Speakers:**

Prof. Dr.-Ing. Horst Kreimes

**Venue:**

Ballroom C, 1st Floor, Millennium Hilton Hotel, Bangkok

|               |                                                                                                                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9:00 - 9:20   | – Welcome and course introduction (20 min)                                                                                                                                                                                                                                                                   |
| 9:20 - 9:30   | – Pre-test                                                                                                                                                                                                                                                                                                   |
| 9:30 - 10:30  | <b>Session 1: Introduction to Thermodynamics</b> <ul style="list-style-type: none"> <li>– Fundamental thermodynamic principles (First and Second laws)</li> <li>– Heat transfer mechanisms (Conduction, convection, radiation)</li> <li>– Basic energy concept (Energy efficiency and management)</li> </ul> |
| 10:30 - 10:45 | Coffee break                                                                                                                                                                                                                                                                                                 |
| 10:45 - 12:00 | – Heat exchanger fundamentals and design principles                                                                                                                                                                                                                                                          |
| 12:00 - 13:00 | Lunch                                                                                                                                                                                                                                                                                                        |
| 13:00 - 14:30 | <b>Session 2: Pinch Analysis</b> <ul style="list-style-type: none"> <li>– Pinch analysis concept</li> <li>– Composite curve construction and pinch point identification (Step-by-step procedure)</li> </ul>                                                                                                  |
| 14:30 - 15:30 | <ul style="list-style-type: none"> <li>– Heat exchanger network synthesis</li> <li>– Case studies</li> </ul>                                                                                                                                                                                                 |
| 15:30 - 15:45 | Coffee break                                                                                                                                                                                                                                                                                                 |
| 15:45 - 16:45 | – Assignment                                                                                                                                                                                                                                                                                                 |
| 16:45 - 17:00 | – Post-test                                                                                                                                                                                                                                                                                                  |



**Day 2 (18<sup>th</sup> August 2026)****Module 2: Renewable Thermal Technologies****Speakers:**

Prof. Dr.-Ing. Horst Kreimes

**Venue:**

Ballroom C, 1st Floor, Millennium Hilton Hotel, Bangkok

9:00 - 9:10 – Pre-test

**9:10 - 10:30 Session 1: Waste heat recovery**

- Characteristics of waste heat (Temperature, Sources/sector of waste heat)
- Technology solutions for using waste heat

10:30 - 10:45 Coffee break

- 10:45 - 12:00 – Applications for waste heat (e.g. drying processes in food and agro-industries)
- Case studies

12:00 - 13:00 Lunch

**13:00 - 14:00 Session 2: Industrial heat pump**

- Working principles of heat pumps
- Heat pump types
- Technological potential and limitations

- 14:00 - 15:00 – High temperature heat pumps (HTHP) in practice
  - Component design for HTHP
  - Safety and compliance

15:00 - 15:15 Coffee break

- 15:15 - 16:45 – Performance measurements
- Examples of practical experience in commercial and industrial sectors
- Assignment

16:45 - 17:00 – Post-test



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**Day 3 (19<sup>th</sup> August 2026)**

**Module 3: Process Optimization and System Integration**

**Speakers:**

Dr. Yanin Sukjai, KMUTT

**Venue:**

Preeda Viboonsawasdi Meeting Room, 2nd Floor, School of Energy, Environment and Material, KMUTT (Bangmod)

|               |                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------|
| 9:00 - 9:10   | – Pre-test                                                                                                                      |
| 9:10 - 10:30  | <b>Session 1: Optimization &amp; Integration</b><br>– Process integration of industrial heat pumps                              |
| 10:30 - 10:45 | Coffee break                                                                                                                    |
| 10:45 - 12:00 | – Energy savings potential via pinch analysis and energy demand management<br>– Power management using demand response measures |
| 12:00 - 13:00 | Lunch                                                                                                                           |
| 13:00 - 14:00 | <b>Session 2: HTHP Workshop</b><br>– Laboratory visit : HTHP at KMUTT                                                           |
| 14:00 - 15:00 | – Assignment I : Heat pump performance evaluation                                                                               |
| 15:00 - 15:15 | Coffee break                                                                                                                    |
| 15:15 - 16:15 | – Assignment II : Energy saving /CO <sub>2</sub> reduction potential                                                            |
| 16:15 - 16:30 | – Post-test                                                                                                                     |



Advanced Training in SMRs,  
Clean Heat, and Hydrogen Technologies  
Advancing Skills for Thailand's Net-Zero Energy Transition

**Clean Heat Training program**

**Day 4 (20<sup>th</sup> August 2026)****Module 4: Energy Storage Systems**

|               |                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | <b>Speakers:</b><br>Prof. Dr.-Ing. Horst Kreimes<br>Dr. Siricharn Jirapongphan<br>Assoc. Prof. Dr. Pipat Chaiwiwatworakul<br><b>Venue:</b><br>Ballroom C, 1st Floor, Millennium Hilton Hotel, Bangkok |
| 9:00 - 9:10   | – Pre-test                                                                                                                                                                                            |
| 9:10 - 10:30  | <b>Session 1: Thermal energy storage</b><br>– Thermal energy storage                                                                                                                                  |
| 10:30 - 10:45 | Coffee break                                                                                                                                                                                          |
| 10:45 - 12:00 | – Energy storage density and performance metrics (e.g. MWh/m <sup>3</sup> , efficiency, discharge rate)                                                                                               |
| 12:00 - 13:00 | Lunch                                                                                                                                                                                                 |
| 13:00 - 14:30 | – CHILLOX thermal energy storage applied in building and cold storage<br><b>Session 2: Financial analysis</b><br>– Value of waste heat                                                                |
| 14:30 - 15:30 | – Financial analysis and business models of heat pump <ul style="list-style-type: none"> <li>• CAPEX &amp; OPEX of HTHP</li> </ul> – Break-even COP                                                   |
| 15:30 - 15:45 | Coffee break                                                                                                                                                                                          |
| 15:45 - 16:45 | – Economic analysis and viability of HTHP<br>– Levelized cost of heat for industrial process heat<br>– Assignment                                                                                     |
| 16:45 - 17:00 | – Post-test                                                                                                                                                                                           |



**Day 5 (21<sup>st</sup> August 2026)****Module 5: Policy and Market Frameworks for Clean Heat**

|               |                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | <b>Speakers:</b><br>Prof. Dr.-Ing. Horst Kreimes<br>Dr. Paweetida Sungwornpatansakul<br>Dr. Sontaya Krichnavaruk<br><b>Venue:</b><br>Ballroom C, 1st Floor, Millennium Hilton Hotel, Bangkok                                         |
| 9:00 - 9:10   | – Pre-test                                                                                                                                                                                                                           |
| 9:10 - 10:30  | <b>Session 1: Policy and Market Framework</b><br>– Status of clean heat: An international outlook<br>– Technical and economic barriers<br>– Policy initiatives and actions to promote clean heat (German and EU clean heat standard) |
| 10:30 - 10:45 | Coffee break                                                                                                                                                                                                                         |
| 10:45 - 12:00 | – Clean heat policy in Asean countries                                                                                                                                                                                               |
| 12:00 - 13:00 | Lunch                                                                                                                                                                                                                                |
| 13:00 - 14:00 | <b>Session 2: Carbon Trading</b><br>– Carbon trading scheme                                                                                                                                                                          |
| 14:00 - 15:15 | – Carbon emission assessment                                                                                                                                                                                                         |
| 15:15 - 15:30 | Coffee break                                                                                                                                                                                                                         |
| 15:30 - 16:45 | – Project assignment                                                                                                                                                                                                                 |
| 16:45 - 17:00 | – Post-test                                                                                                                                                                                                                          |

Updated on 31 July 2026

