ECONOMIC EVALUATION OF THE REDUCTION OF NETWORK TEMPERATURES – DEVELOPMENT OF A METHODOLOGY FOR THE DEVELOPMENT OF MOTIVATIONAL TARIFFS

19. Symposium Energieinnovation

11-13 February 2026, Graz

Nicolas Oliver Marx, Verena Alton, Martin Cizmar, Ralf-Roman Schmidt, Lukas Kranzl, Ali Kök, Andreas Müller

PROJECT OVERVIEW

- **Partner**
  - Utilities: Wien Energie GmbH, Salzburg AG, Linz Strom Gas Wärme GmbH, Energie Klagenfurt GmbH, Energie Graz
  - Engineering: myWarm GmbH, ALLPLAN GmbH; Käferhaus GmbH
  - Research: AIT Austrian Institute of Technology GmbH; AEE INTEC; TU Wien/ EEG; Grazer Energieagentur; Forschung Burgenland; TU Graz
- **A green energy Lab Project, funded by KLIEN**
- **Run-time**: 15.01.2023 – 14.06.2026
- **Budget**: 2.280.536 Euro (costs) / 1.179.040 Euro (funding)

https://greenenergylab.at/en/projects/deriskdh/

MOTIVATION AND CENTRAL QUESTIONS

- District heating networks in Vienna, Linz, Graz, Klagenfurt and Salzburg primarily based on CHP plants
- Need for alternative heat sources: heat pumps, waste heat, solar, geothermal
- Challenges:
  - Optimization of the building stock
  - Lowering network temperatures
  - Flexibilization of the networks
- Objectives of the DeRiskDH project:
  - Technological solutions and risk assessment
  - Innovative business models for investment security

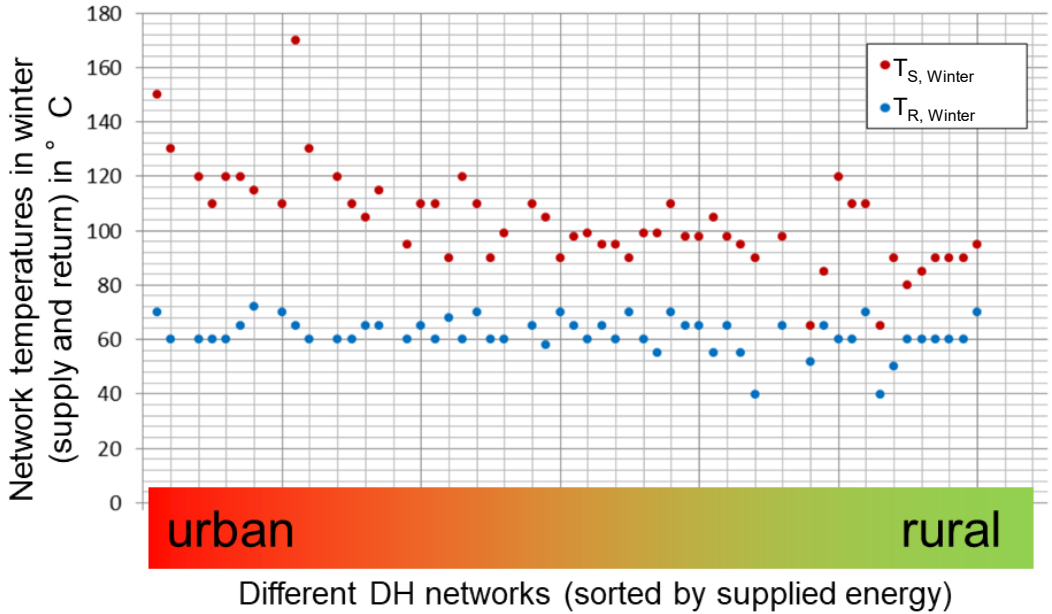
MOTIVATION AND CENTRAL QUESTIONS

- District heating networks in Vienna, Linz, Graz, Klagenfurt and Salzburg primarily based on CHP plants
- Need for alternative heat sources: heat pumps, waste heat, solar, geothermal
- Challenges:
  - Optimization of the building stock
  - Lowering network temperatures
  - Flexibilization of the networks
- Objectives of the DeRiskDH project:
  - Technological solutions and risk assessment
  - Innovative business models for investment security

Main focus of this presentation

CHALLENGE:
HIGH NETWORK TEMPERATURES

Example: supply and return temperatures of different DH networks in Austria



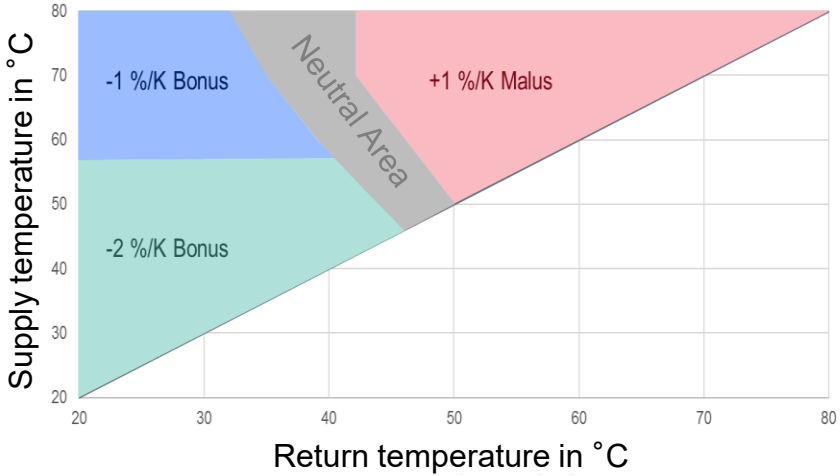
- **High DH network temperatures** create a fatal lock-in effect and significantly reduce the potential for decarbonization
- high heat **losses**
- low **storage** capacities
- Limited **network extension** possibilities
- **Low cost-efficiency** when integrating waste heat, heat pumps, solar- and geothermal energy

http://www.austrian-heatmap.gv.at/fileadmin/user_upload/FW_KWK_Endbericht.pdf

→ **SOLUTION** (EXISTING SYSTEMS)

- **Reducing DH networks temperatures can be done by optimizing buildings heating systems** towards lower return temperatures and lower (peak) heat demand.
- Therefore, **suitable business models are required** considering investor/ user dilemma, contractual terms as well as issues related to responsibilities and ownership
- The project DeRiskDH is looking into these business models including the DH network operators in Vienna, Salzburg, Linz, Graz and Klagenfurt

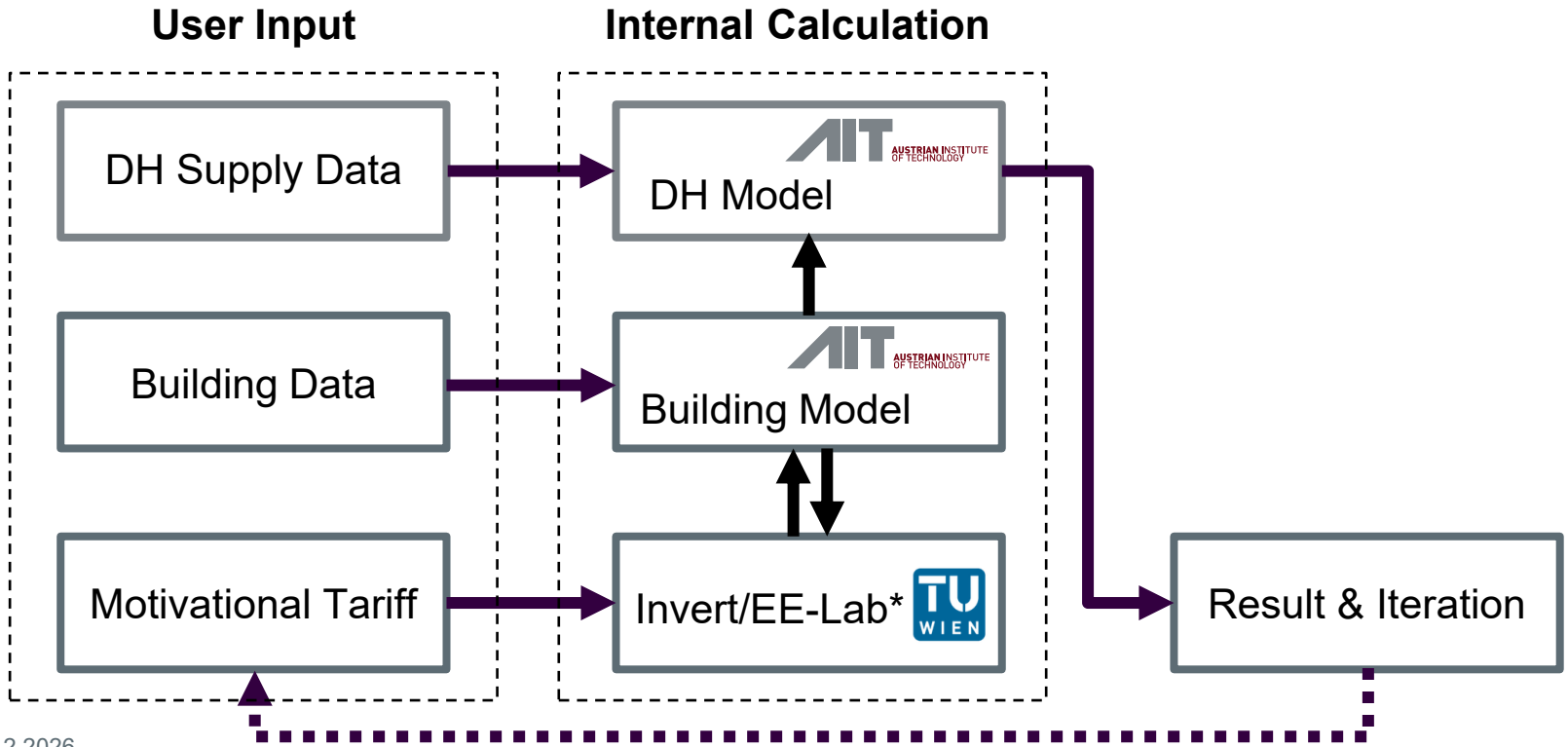
Example for a business model for reducing the return temperatures: motivational tariffs



Diget T/ Frederiksberg, Danish Board of District Heating (DBDH), 2019, pp. 19-22.

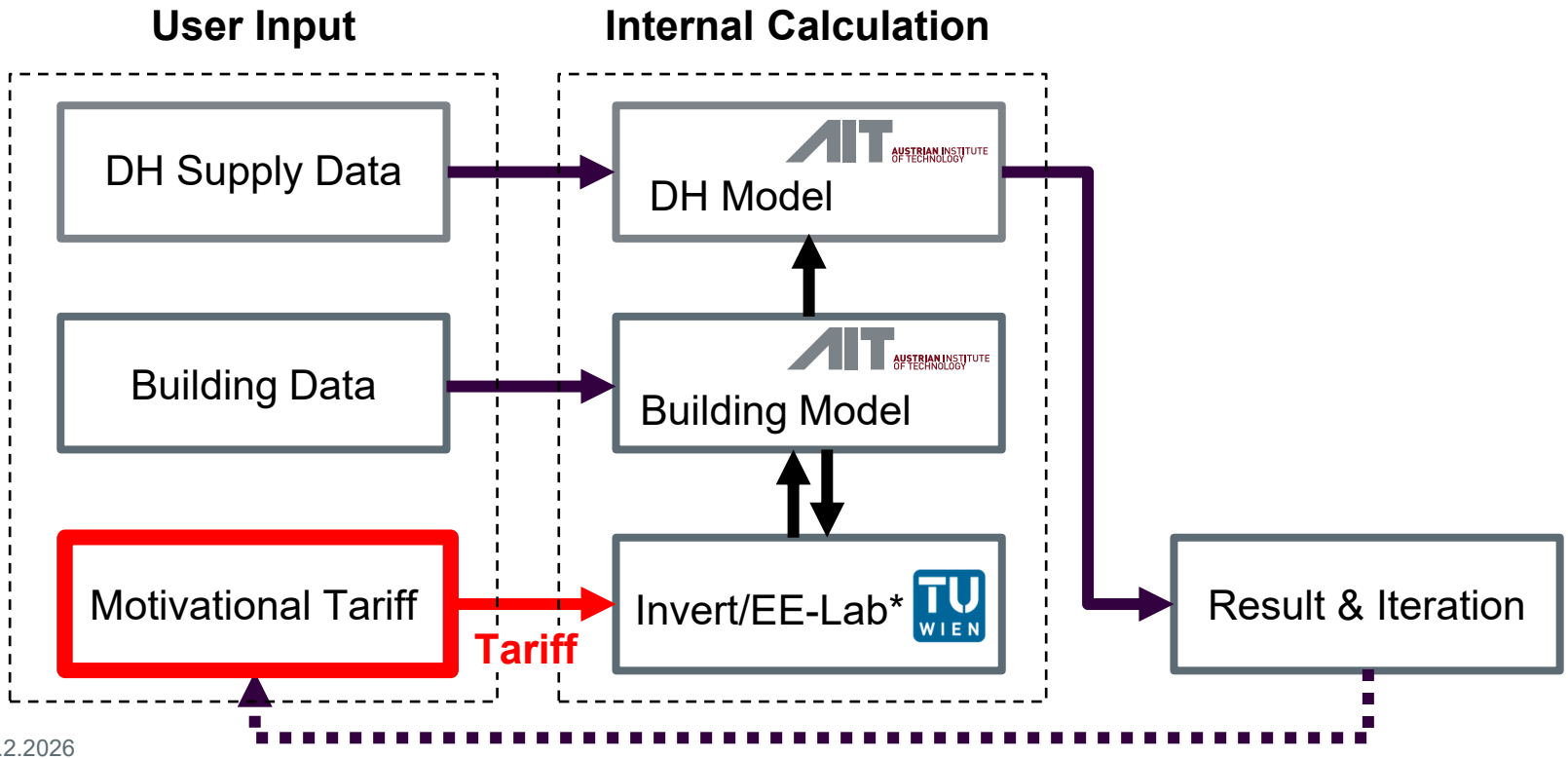
Roman Geyer, et al. 2021, https://doi.org/10.1016/j.segy.2021.100011
Paolo Leoni, et al. 2020, https://doi.org/10.1016/j.energy.2020.116963

THE DeRiskDH TOOL



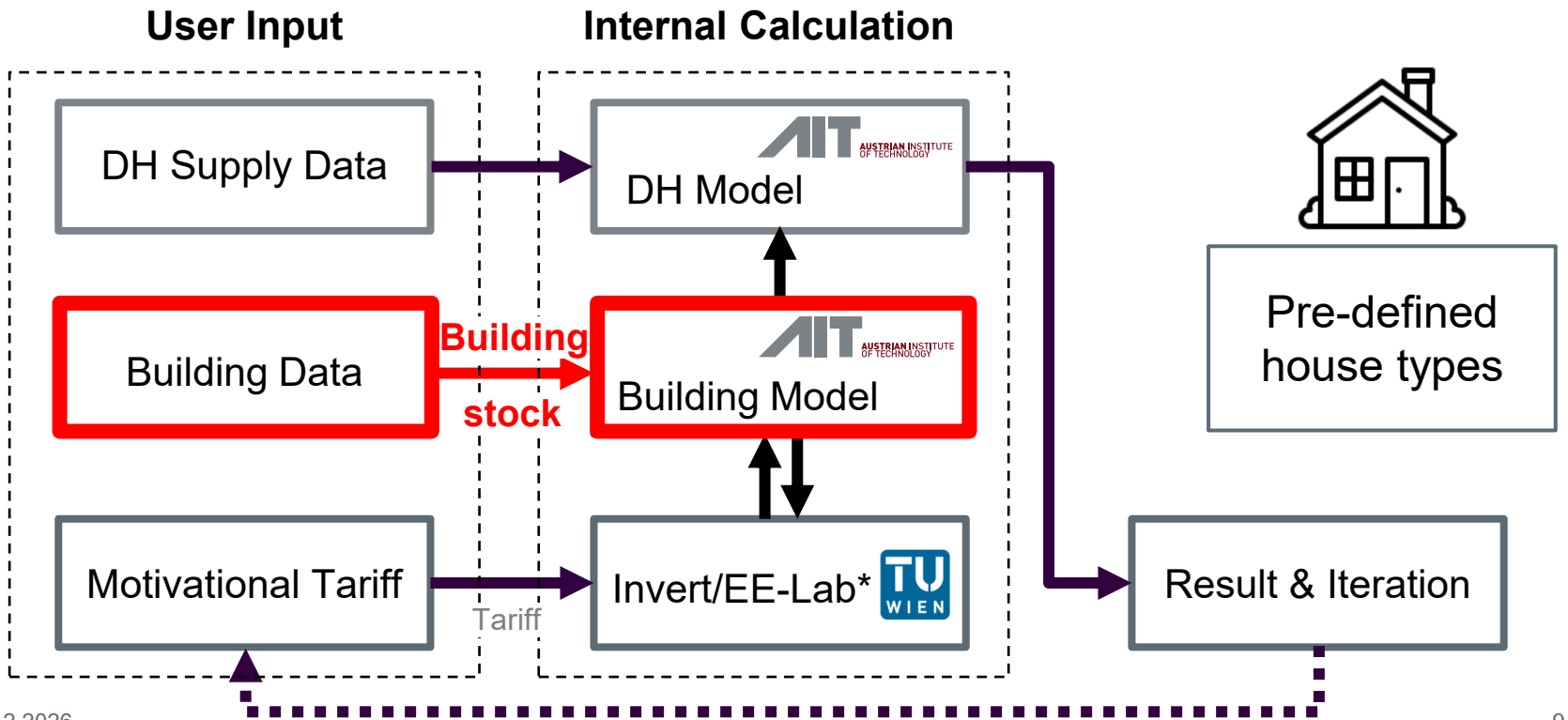
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL



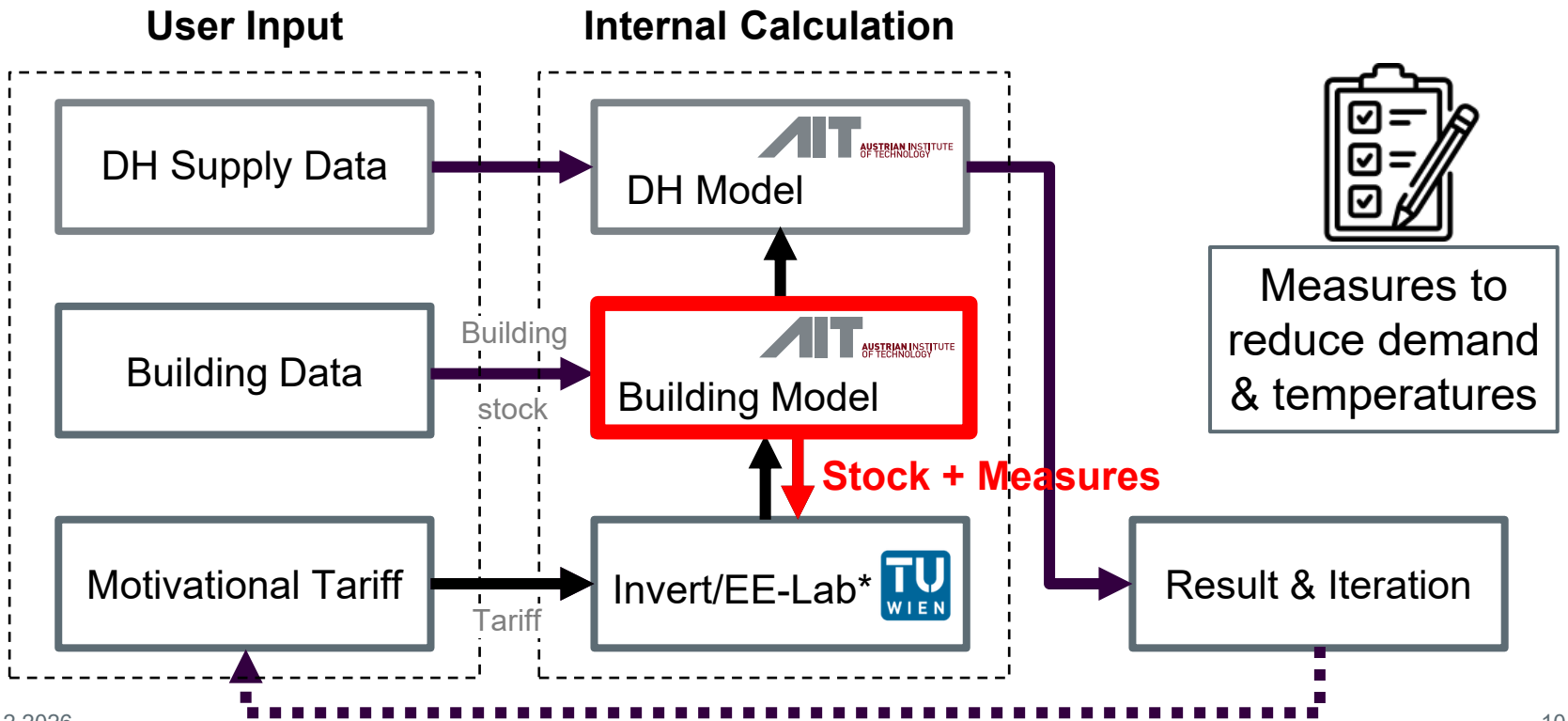
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL



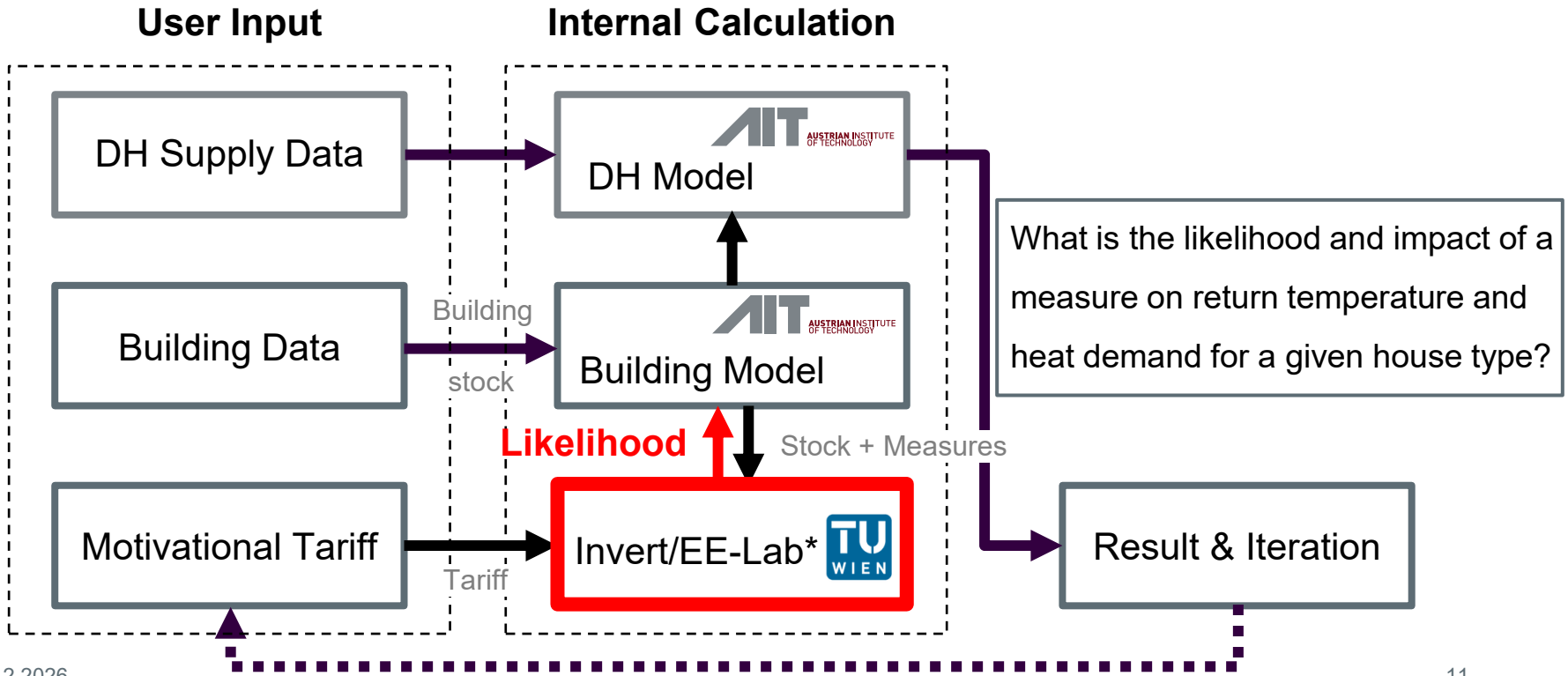
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL



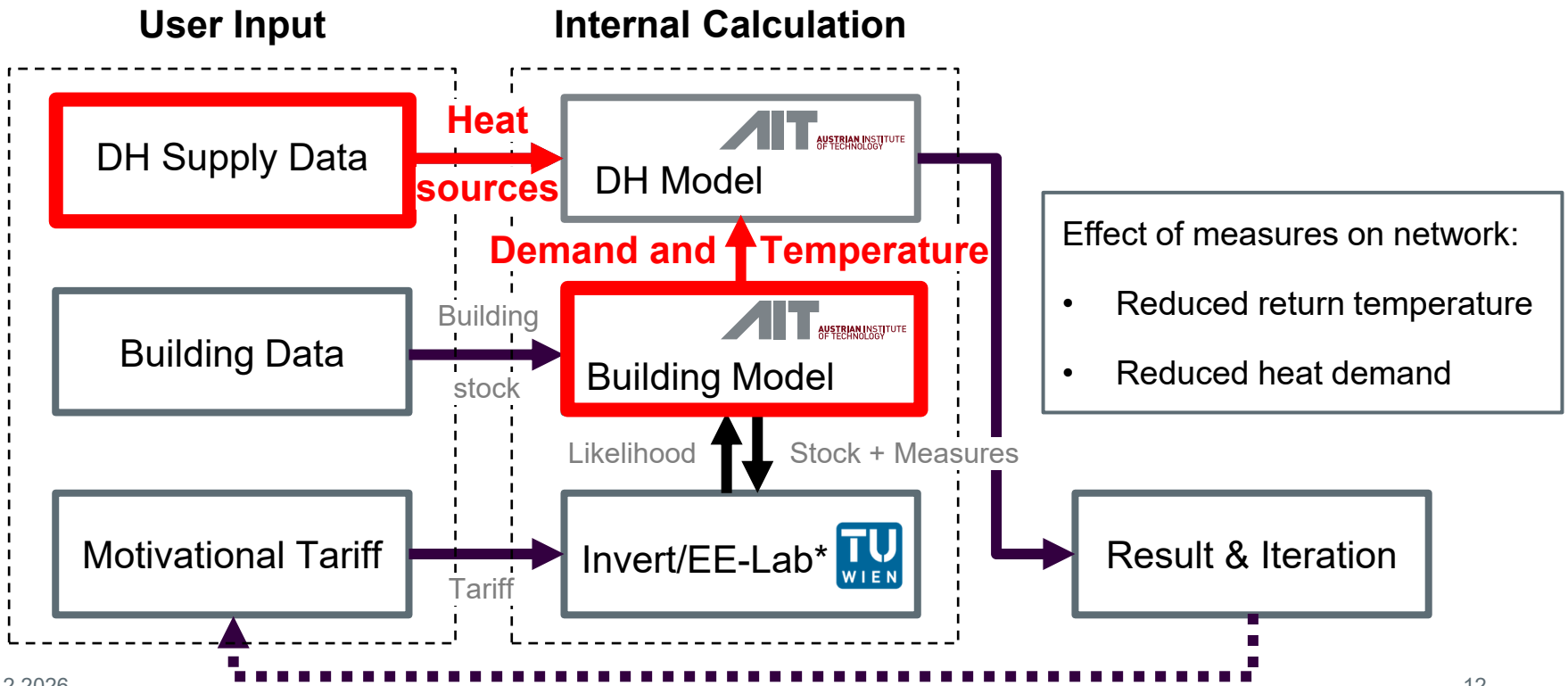
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL



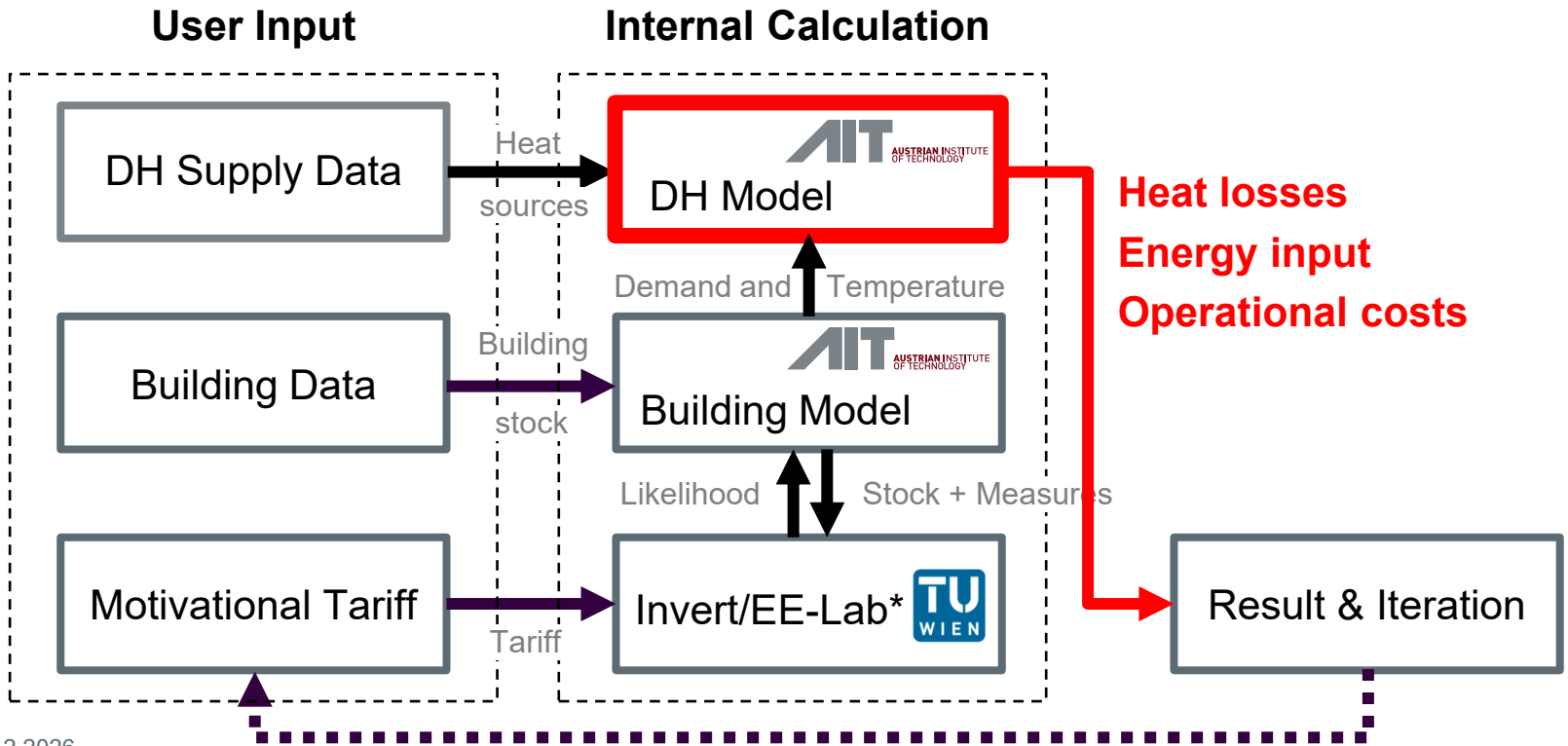
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL



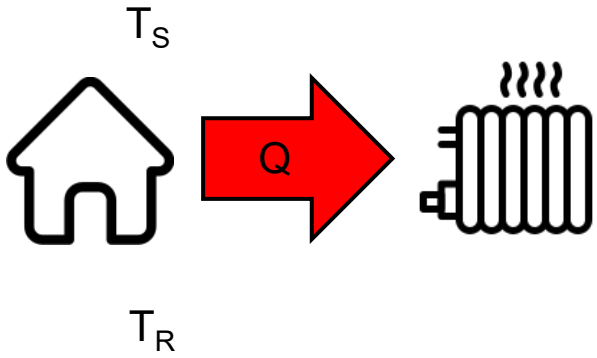
*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

THE DeRiskDH TOOL

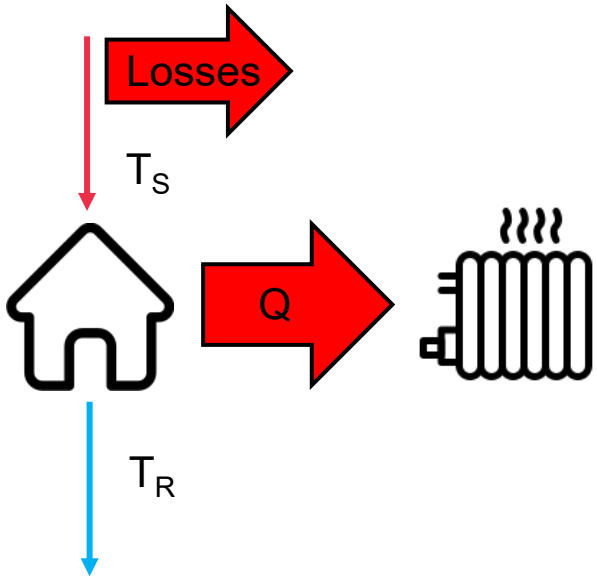


*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

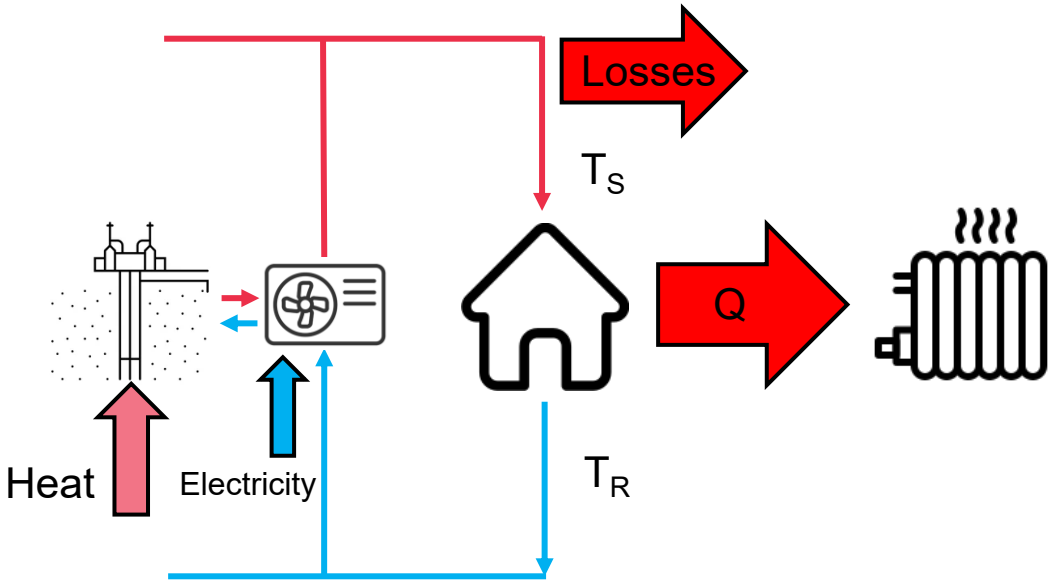
DHN AND SUPPLY CONCEPT



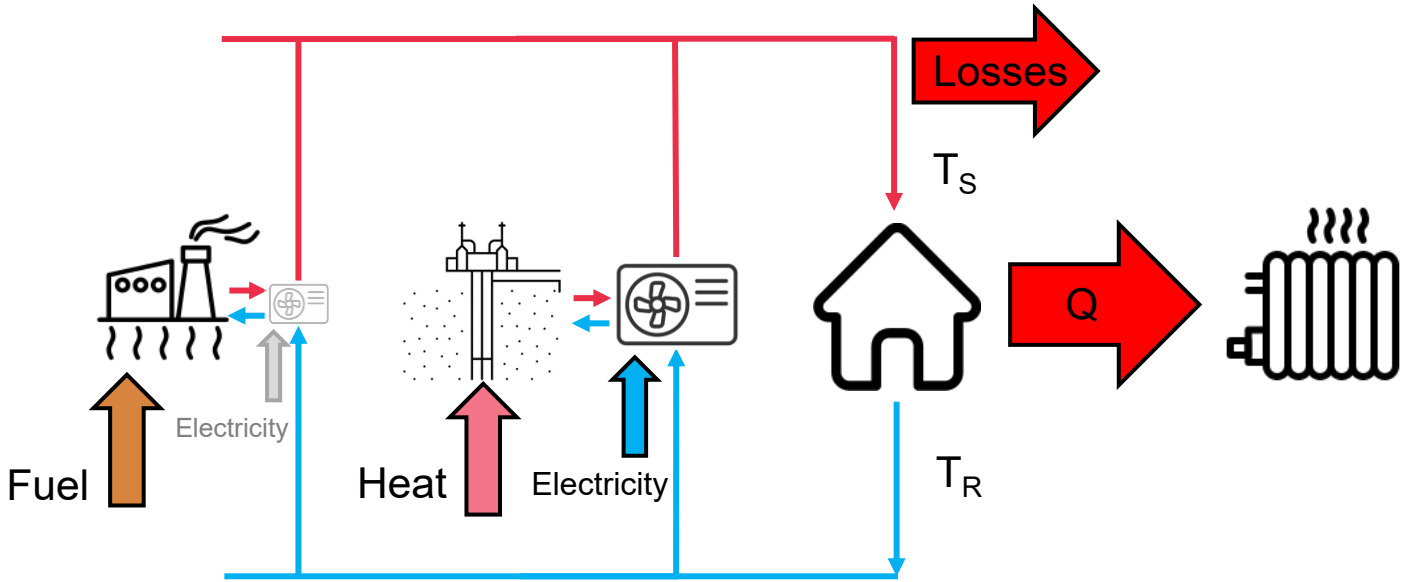
DHN AND SUPPLY CONCEPT



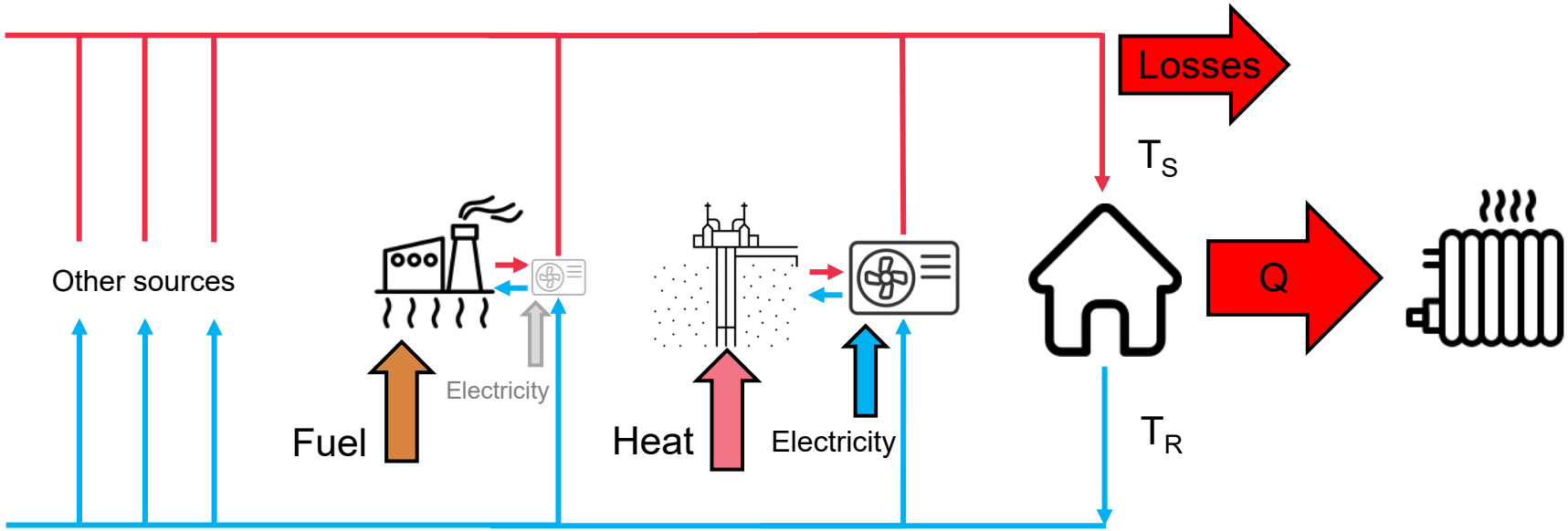
DHN AND SUPPLY CONCEPT



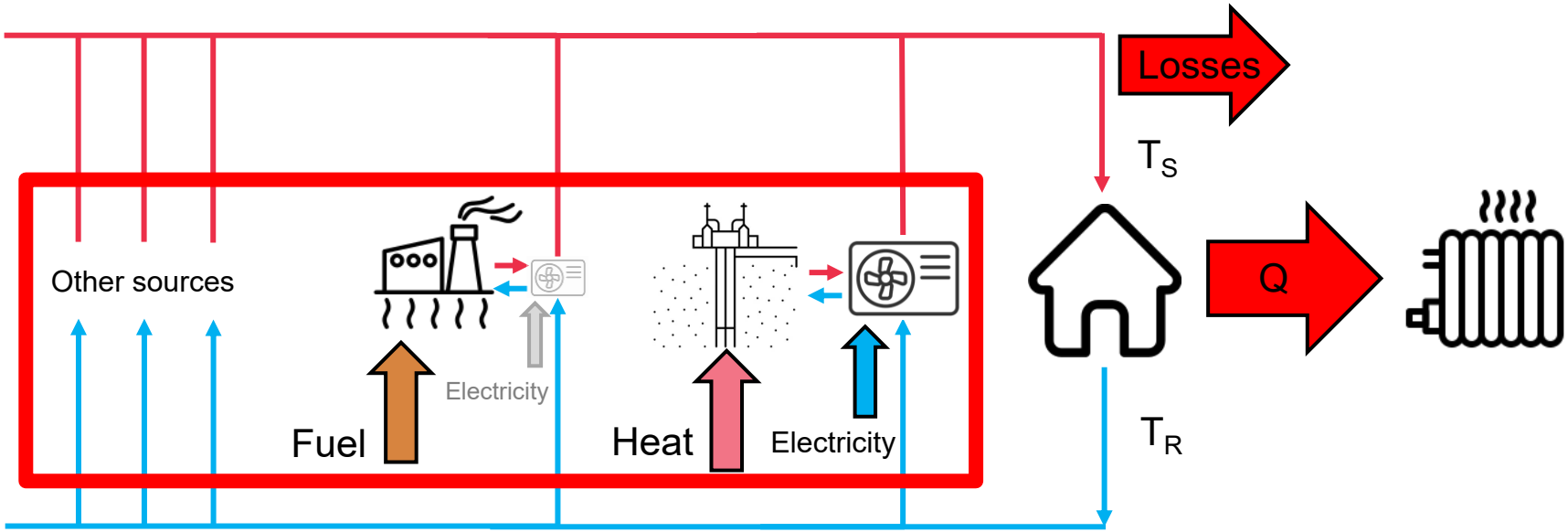
DHN AND SUPPLY CONCEPT



DHN AND SUPPLY CONCEPT



DHN AND SUPPLY CONCEPT

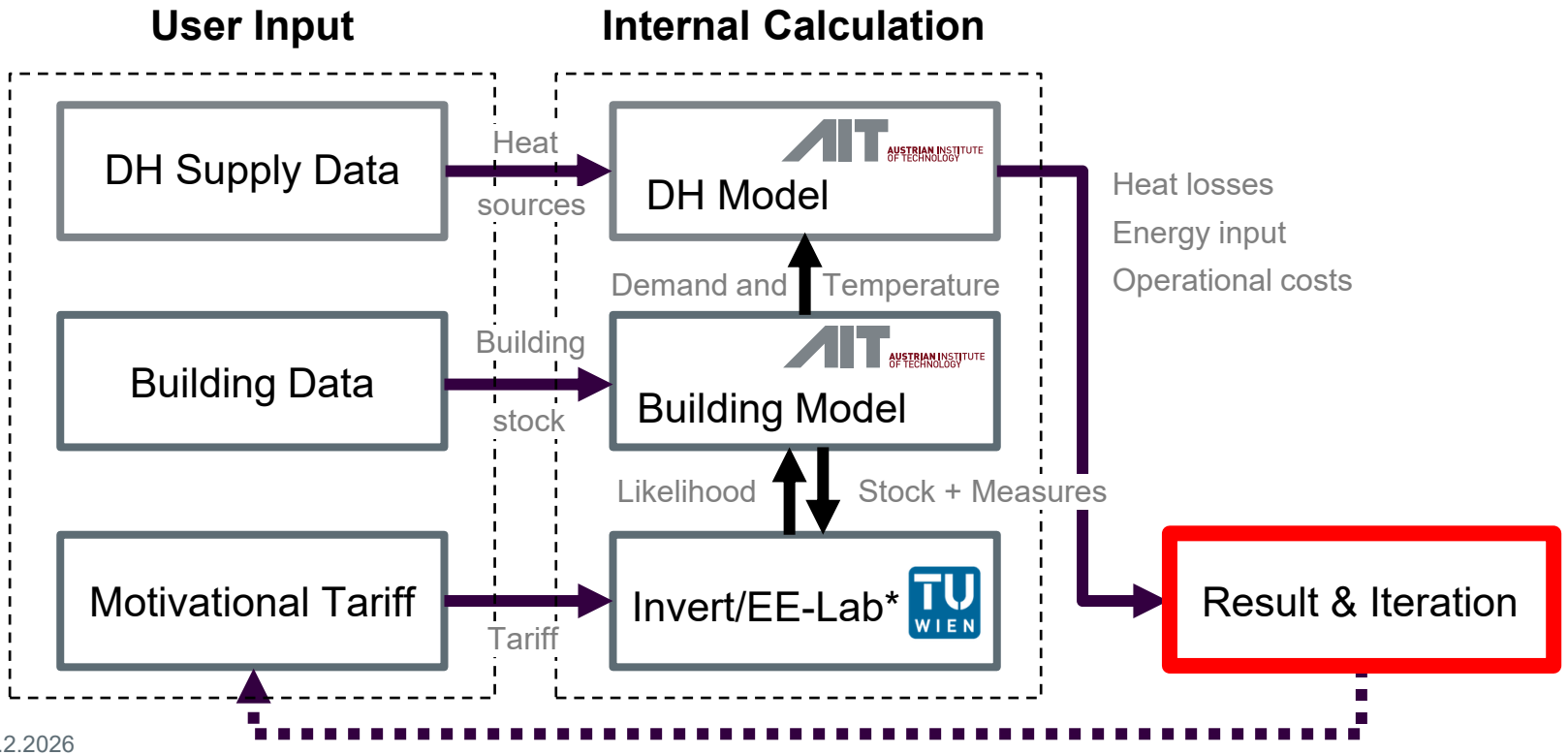


SOURCE MODULES

- Full addition – as simple as possible to still reflect physical behavior
  - Heat pump fully integrated in all sources
  - Combustion module – detailed mass and energy balance
  - Geothermal
  - Solar thermal

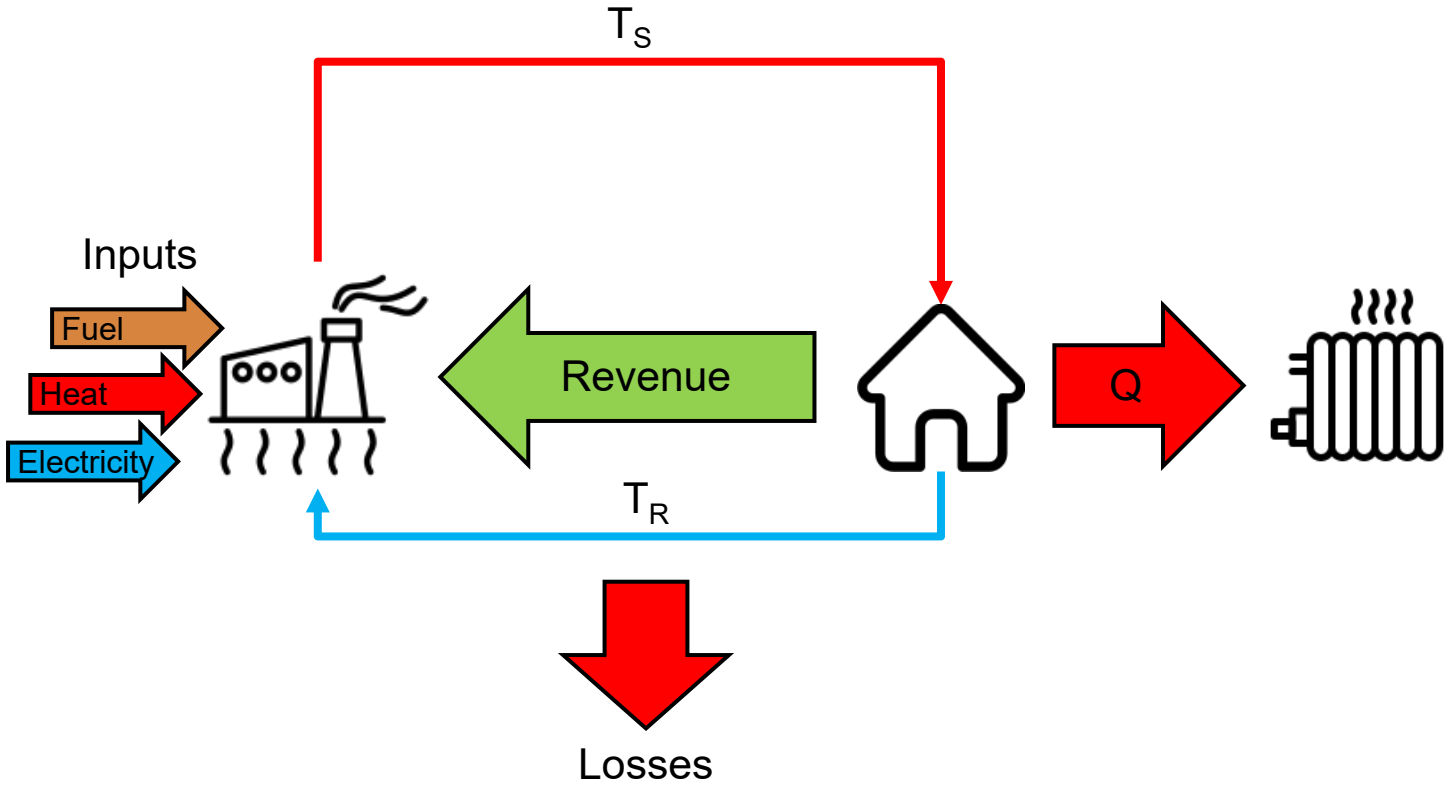
- Simple addition – define as efficiency and “fuel” cost
  - CHP added as 35% of heat in fuel to electricity (sale), 65% to heat network
  - User can also specify

THE DeRiskDH TOOL

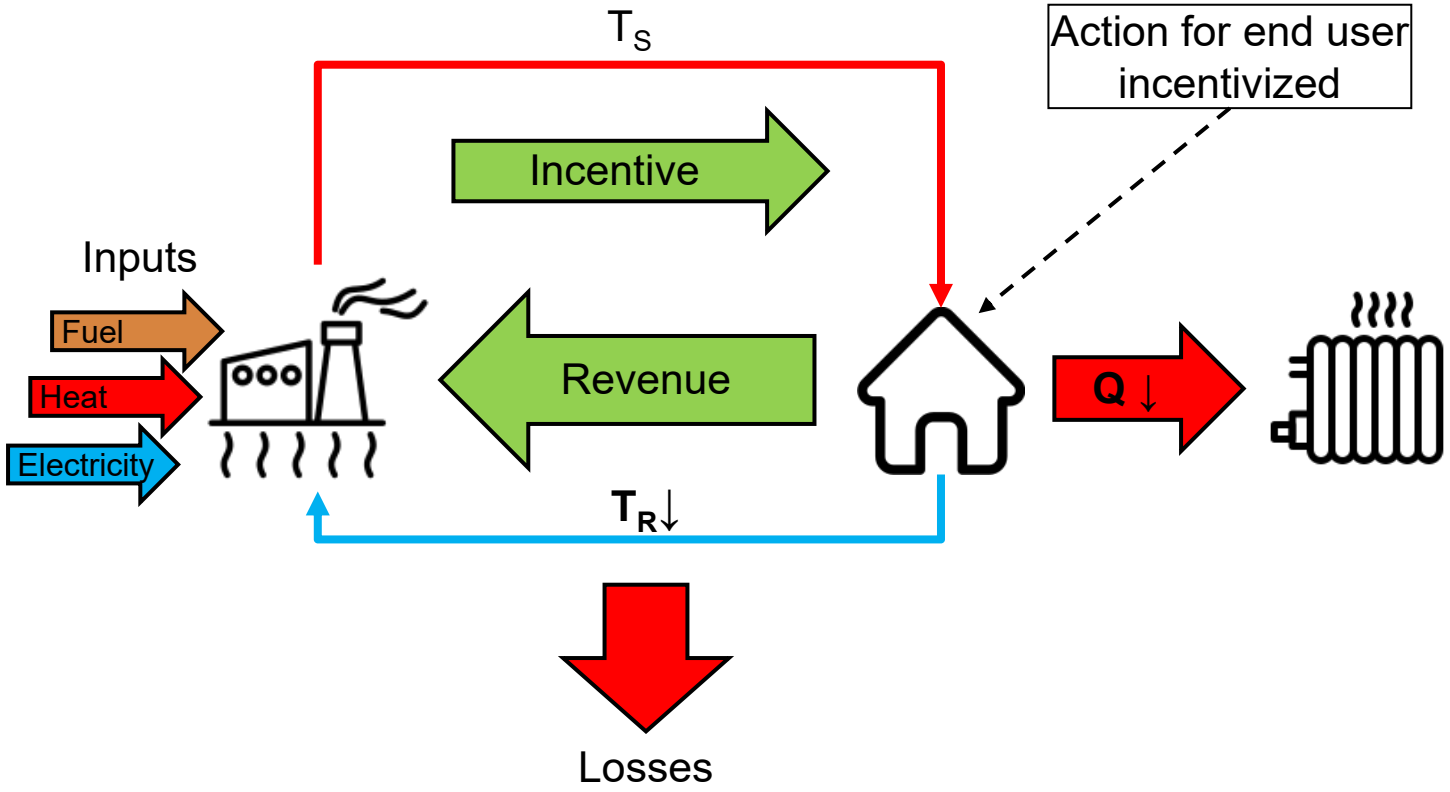


*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

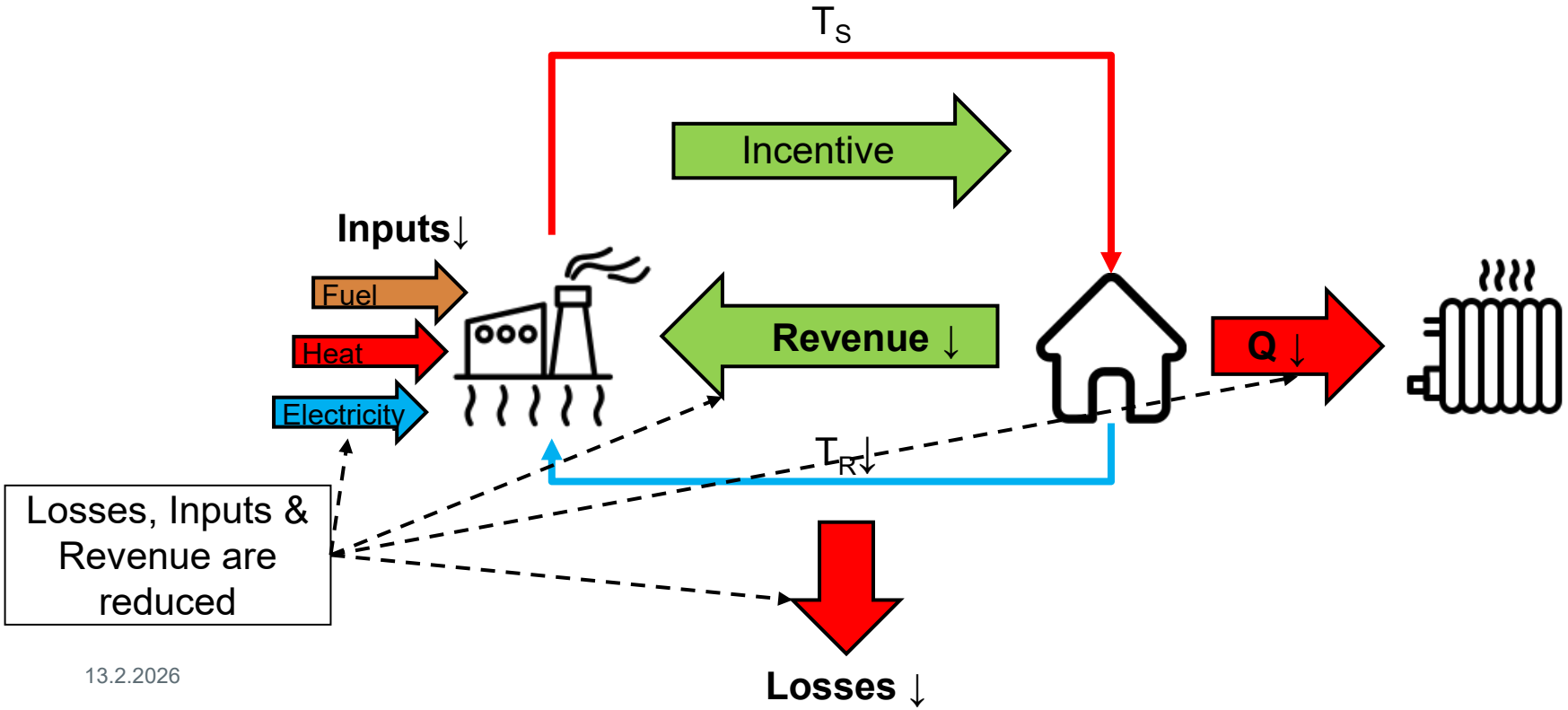
RESULTS & ITERATION



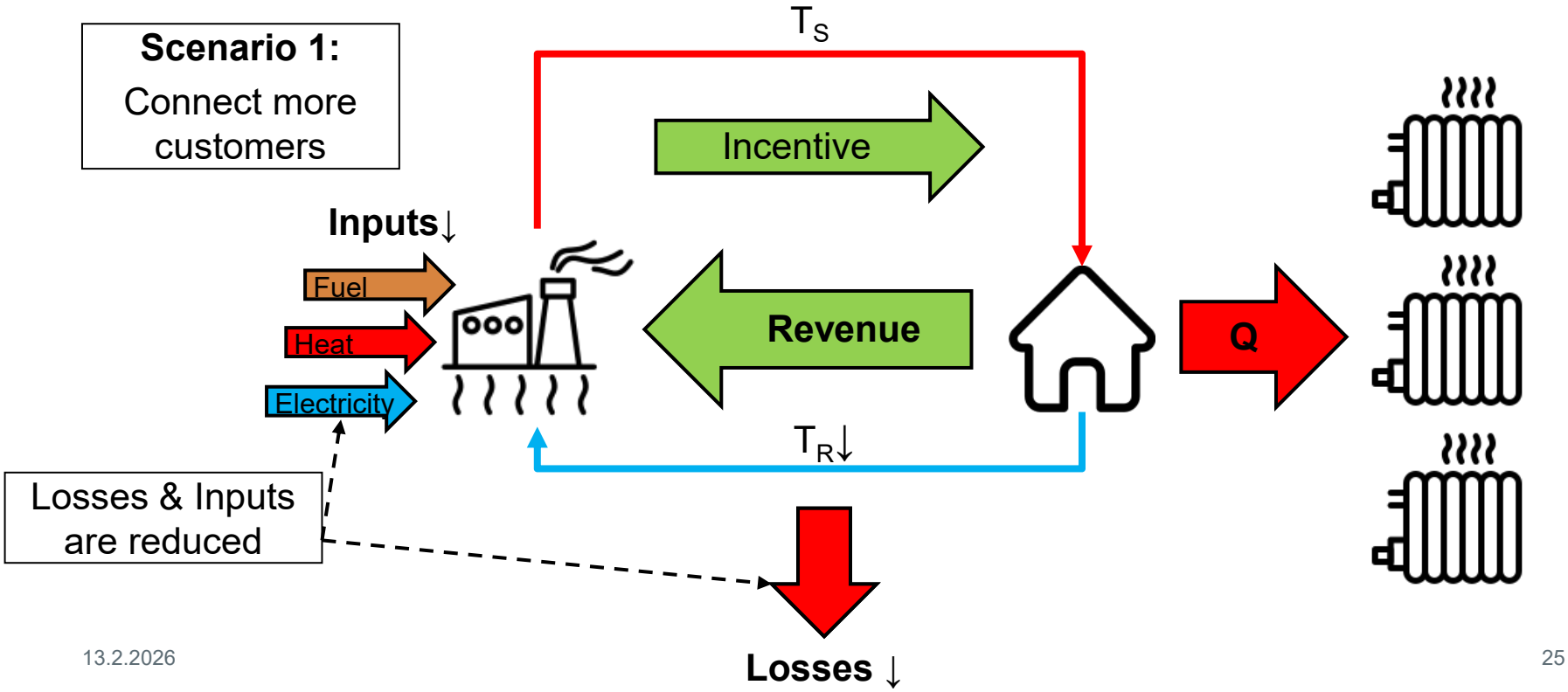
RESULTS & ITERATION



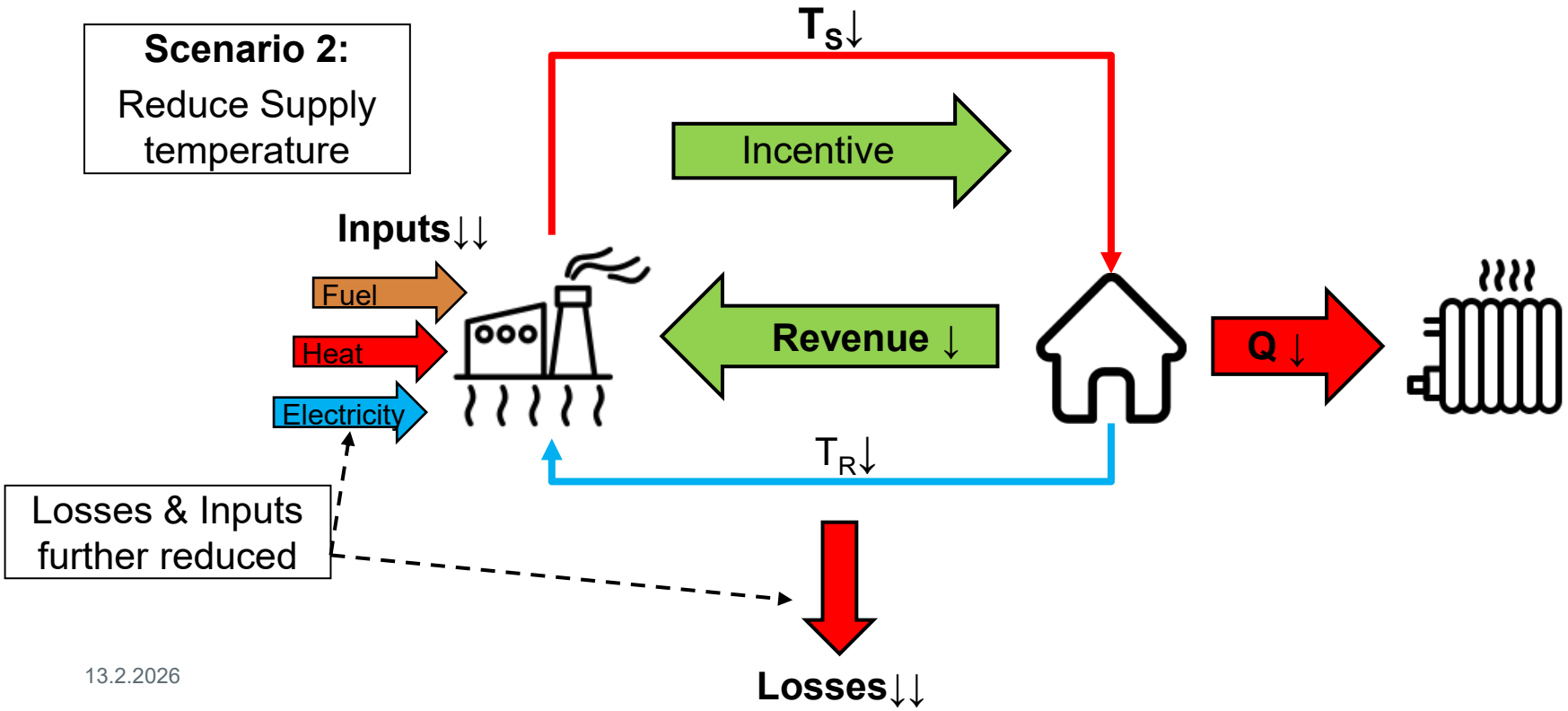
RESULTS & ITERATION



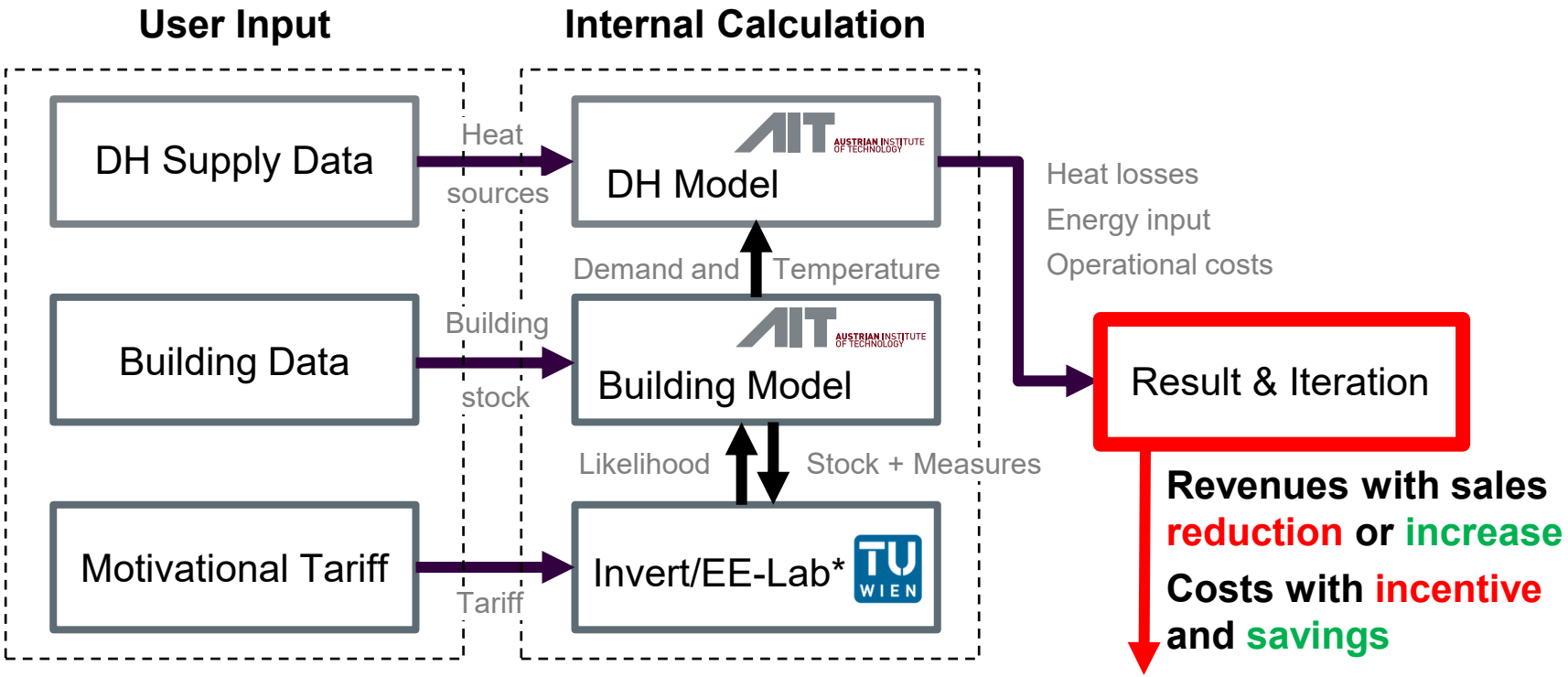
RESULTS & ITERATION



RESULTS & ITERATION

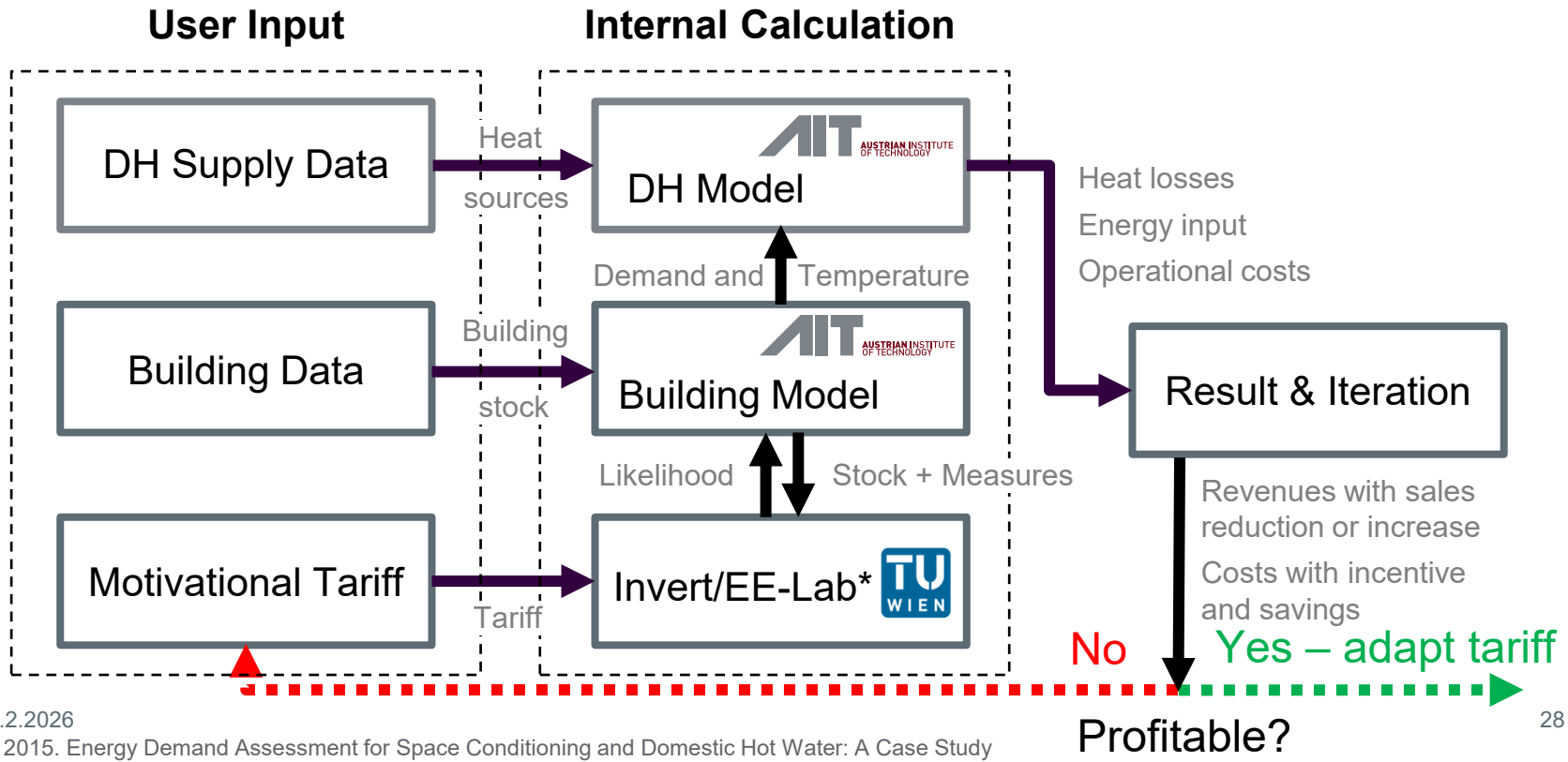


THE DeRiskDH TOOL



*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

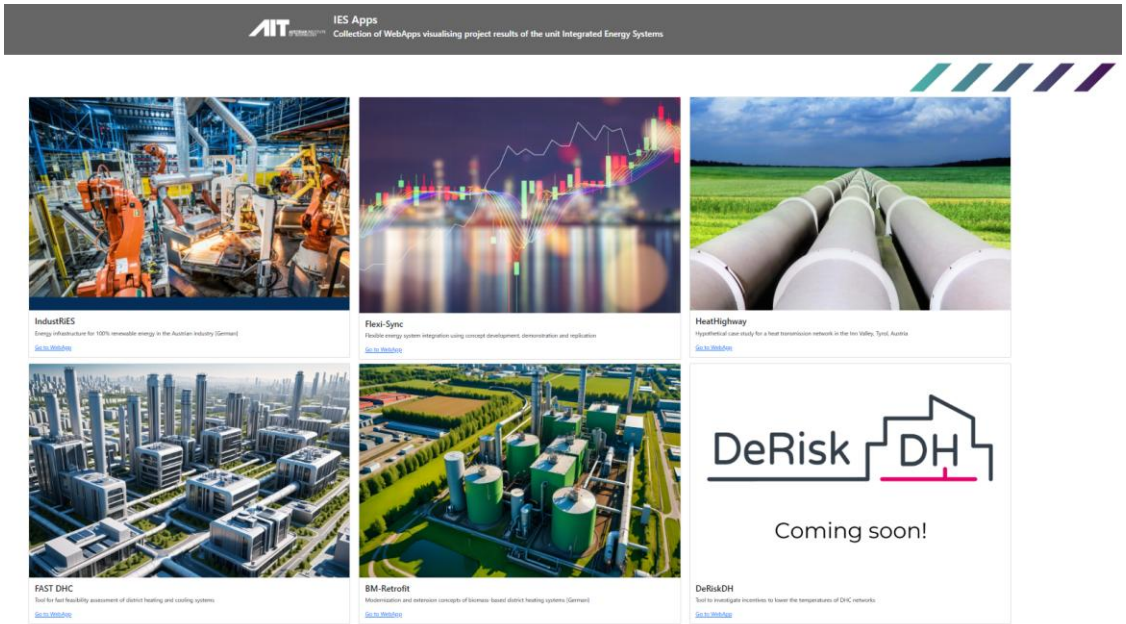
THE DeRiskDH TOOL



*Müller, A., 2015. Energy Demand Assessment for Space Conditioning and Domestic Hot Water: A Case Study for the Austrian Building Stock (PhD-Thesis). Technische Universität Wien, Wien.

OUTLOOK

- COMING SOON!
- Hosting on https://ies-apps.ait.ac.at/



AUSTRIAN INSTITUTE OF TECHNOLOGY
TOMORROW TODAY

THANK YOU!

Martin Cizmar, February 13th, 2026