MODEL PREDICTIVE CONTROL FOR HVAC SYSTEMS

an innovative path towards energy efficiency and better indoor environment quality

Jiří Cigler
Energoklastr, Czech Republic
MODEL PREDICTIVE CONTROL (MPC)

Advanced process control method suitable for control of complex multiple-input multiple-output systems

With regards to energy and buildings, the areas of possible applications:

- Hybrid energy systems
  - Multiple (renewable) sources
  - Energy storages
- Smart-grid and connected systems
  - District heating and cooling systems
  - Time-varying cost
- Complex control objectives

hybridGEOTABS project addresses all above points
## FROM TRADITIONAL TO MPC APPROACH IN BUILDINGS

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PROS AND CONS MPC

+ Faster commissioning
+ Validation of critical situations in advance
+ More precise setpoint tracking – better comfort
+ Energy efficiency – achieve the comfort with minimum energy
+ Model based diagnostics of the operation of the HVAC components

- Model (set of equations) development
- Computational power, specialized libraries for numerical optimisation
MPC BUILDINGS

- INFRAK, Dilbeek BE
  2200m² GEOTABS

- School, Libeznice CZ
  1000m² GEOTABS

- University building, Prague CZ
  70000 m² TABS
  Energy savings 20%

- Office LBM, Prague CZ
  450 m² TABS
  Energy savings 23%

Controlling the power of the ground by integration