



Madalenergia korterelamu küttesüsteemi kadu 35%?

Lahendused õhu kütmise
vältimiseks.

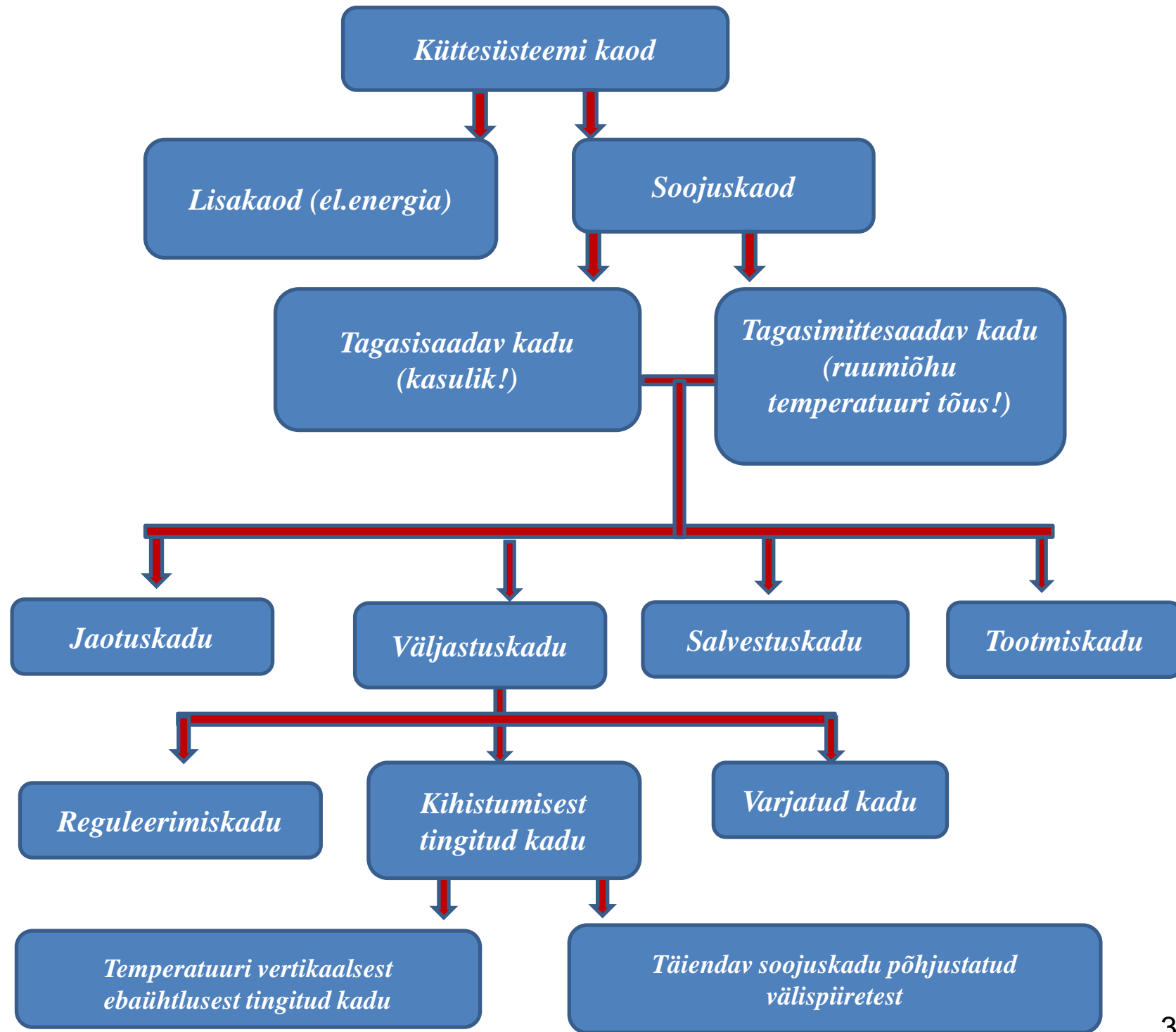
25.04.2013

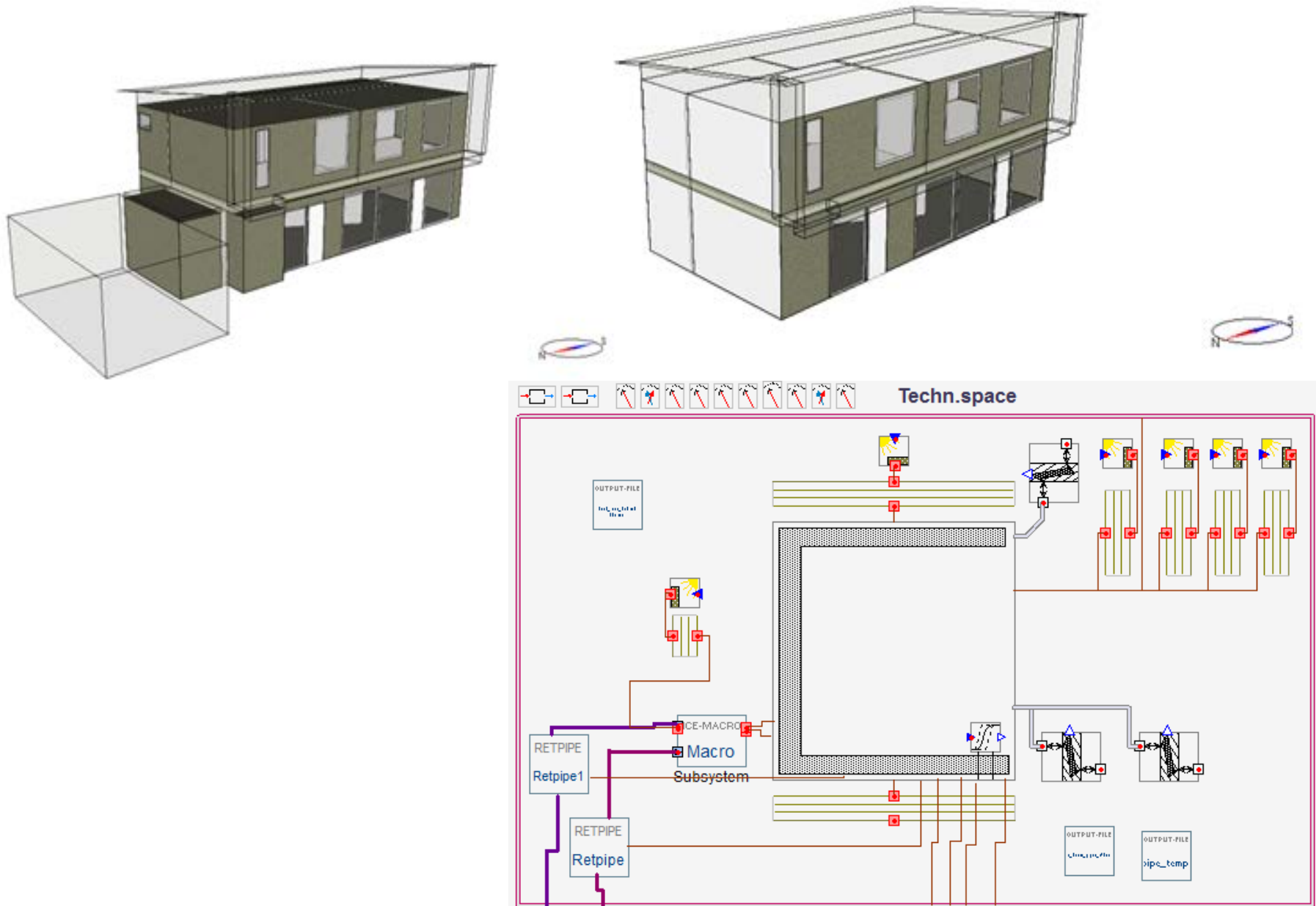
Mikk Maivel

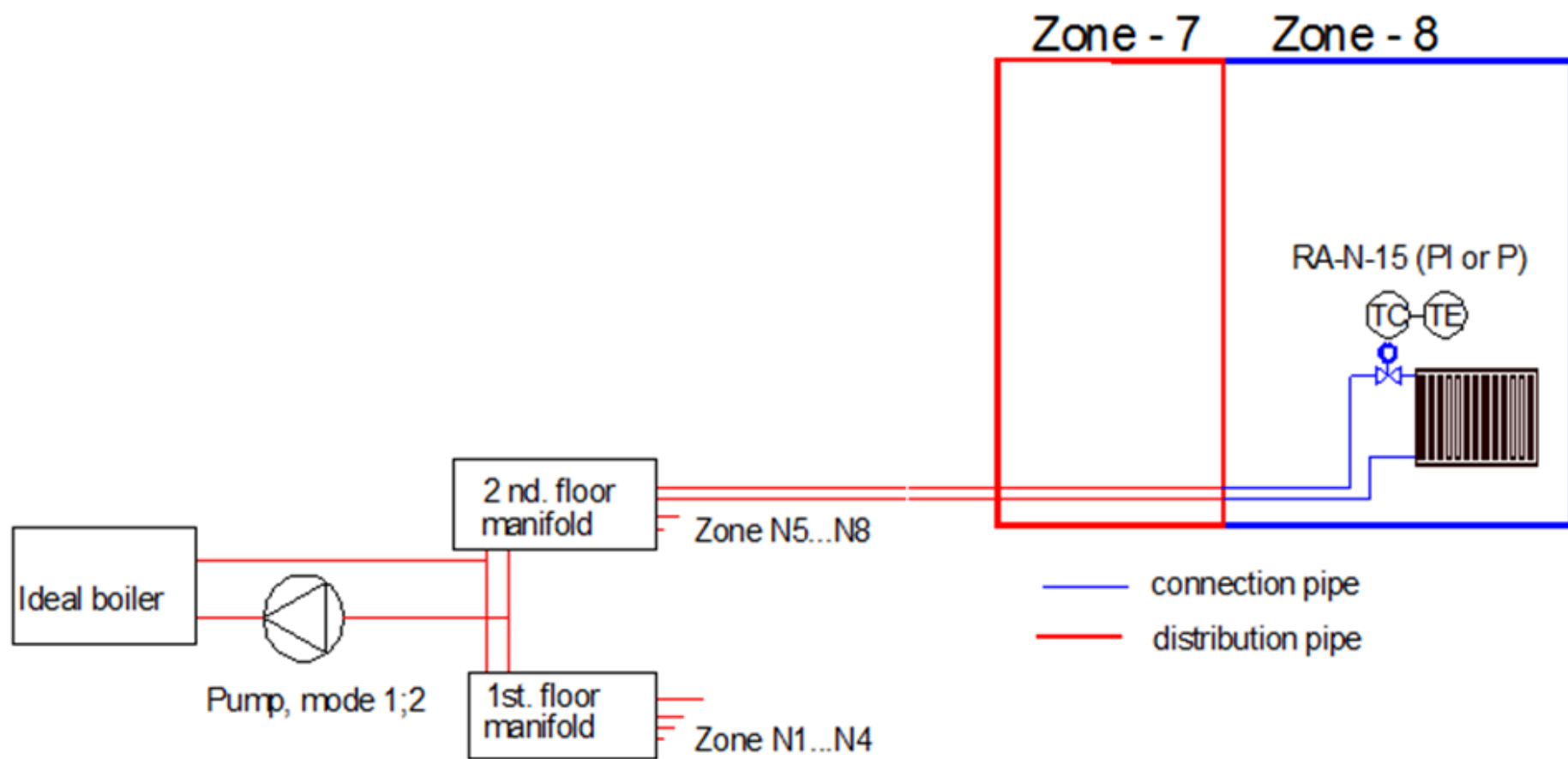
Küttesüsteemi kaod - standardid



- EN 15316-1:2007 Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 1: General
- EN 15316-2-1:2007 Space heating emission systems
- EN 15316-2-3:2007 Space heating distribution systems
- EN 15316-3-1:2007 Domestic hot water systems, characterisation of needs (tapping requirements)
- EN 15316-3-2:2007 Domestic hot water systems, distribution
- EN 15316-3-3:2007 Domestic hot water systems, generation
- EN 15316-4-1:2008 Space heating generation systems, combustion systems (boilers)
- EN 15316-4-2:2008 Space heating generation systems, heat pump systems
- EN 15316-4-3:2007 Heat generation systems, thermal solar systems
- EN 15316-4-4:2007 Heat generation systems, building-integrated cogeneration systems
- EN 15316-4-5:2007 Space heating generation systems, the performance and quality of district heating and large volume systems
- EN 15316-4-6:2007 Heat generation systems, photovoltaic systems
- EN 15316-4-7:2008 Space heating generation systems, biomass combustion systems
- EN 15316-4-8:2011 Space heating generation systems, air heating and overhead radiant heating systems

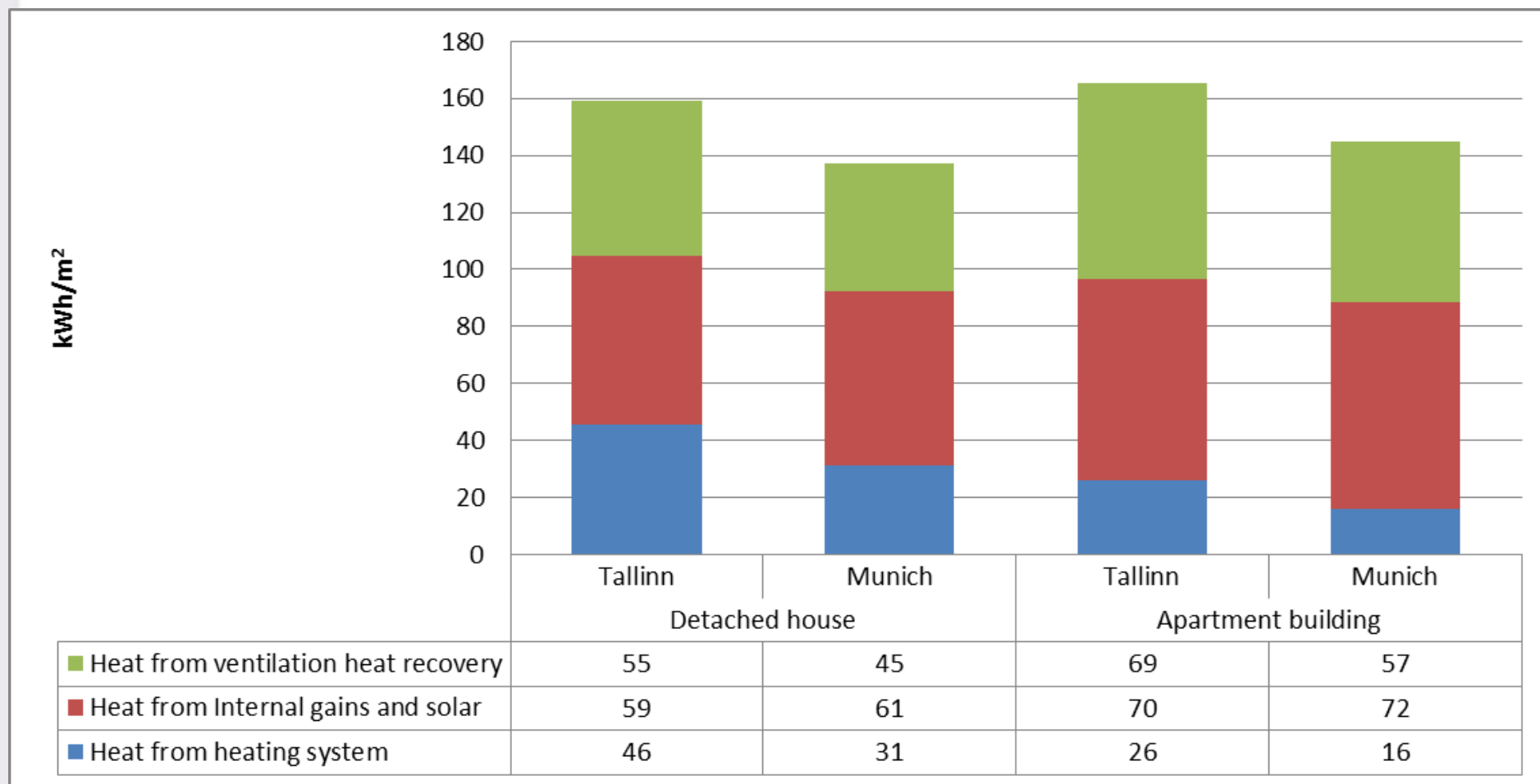






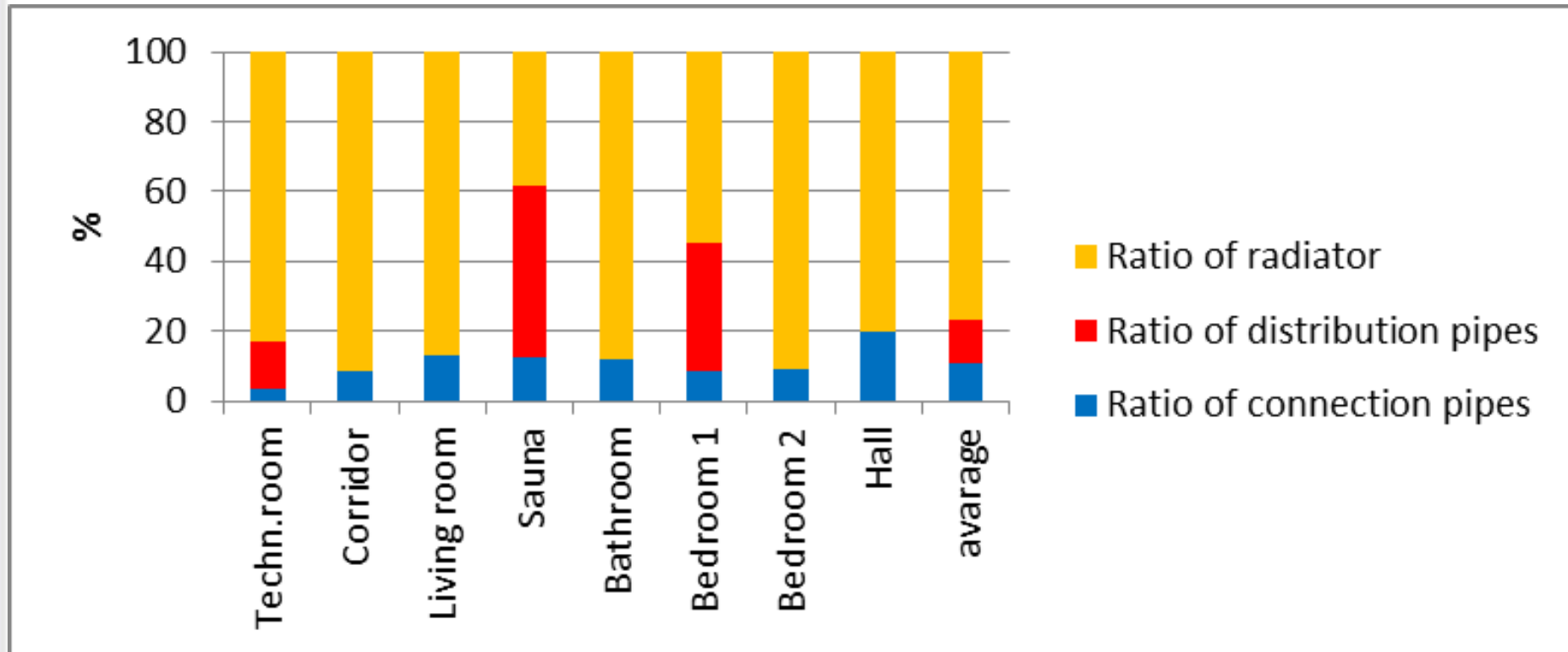


Energiavajadus ruumide ja ventilatsiooni kütteks





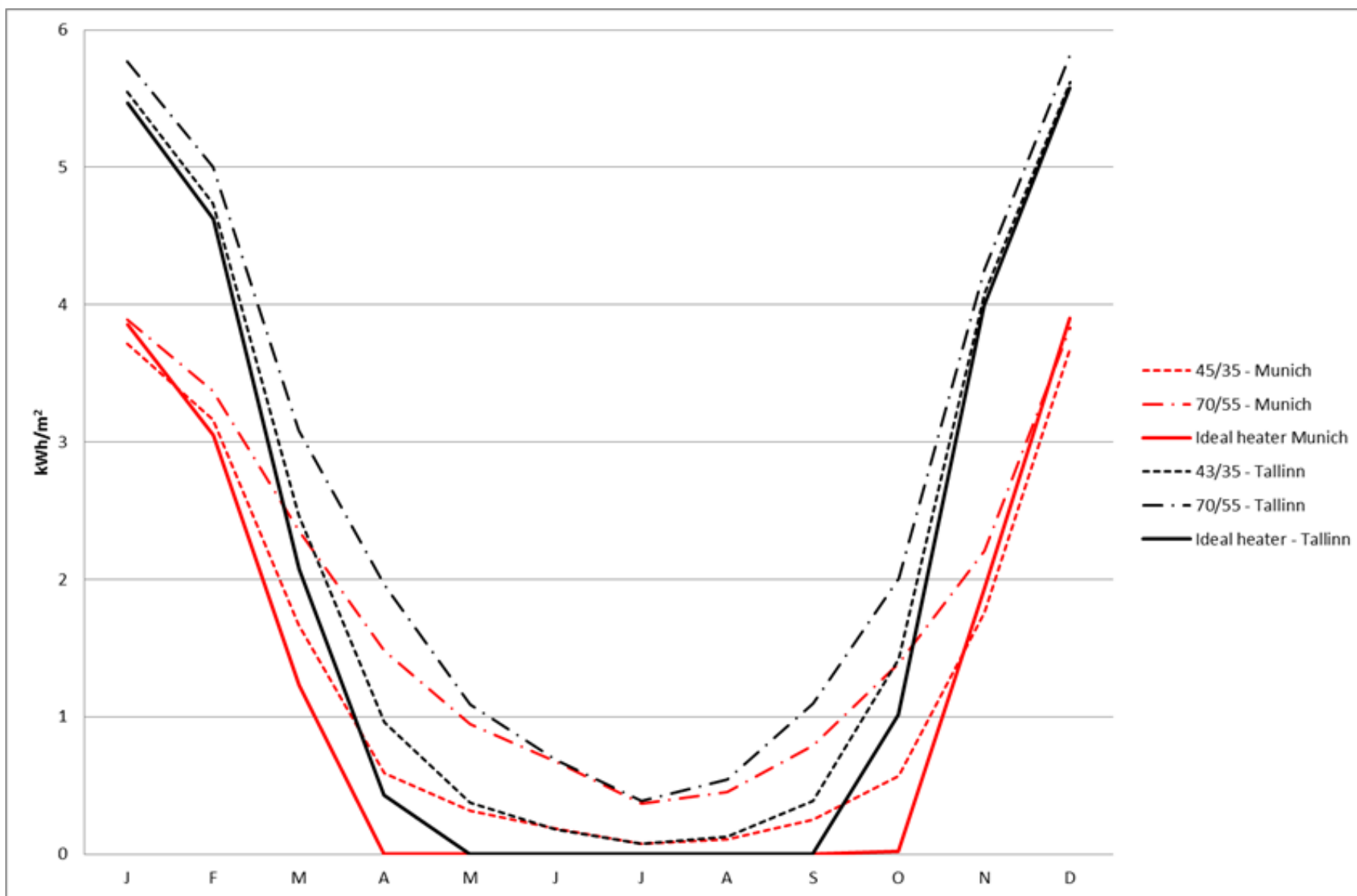
Eramaja radiaatorküttesüsteemi soojusväljastus (45°C/35°C)



Täiendav kadu läbi radiaatori taga oleva seina tühine ca 0.25 %

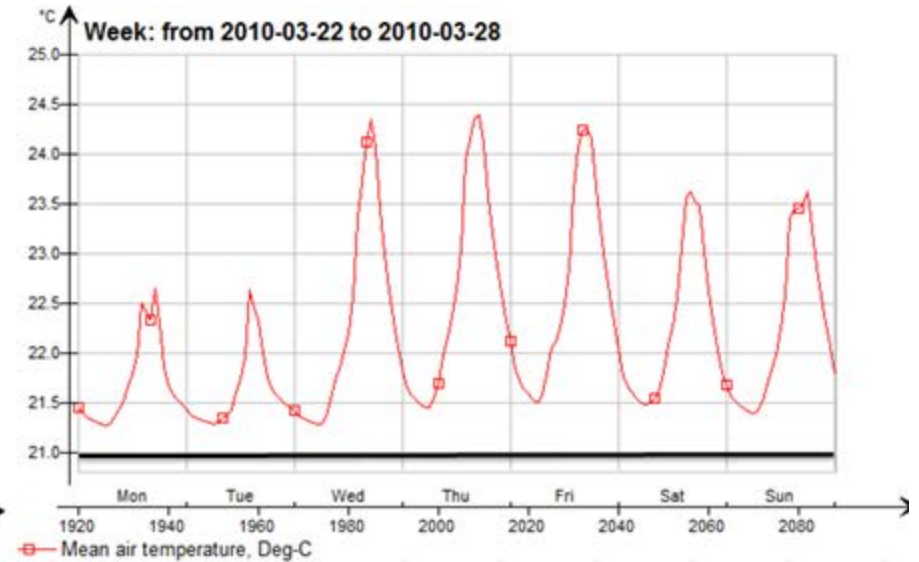
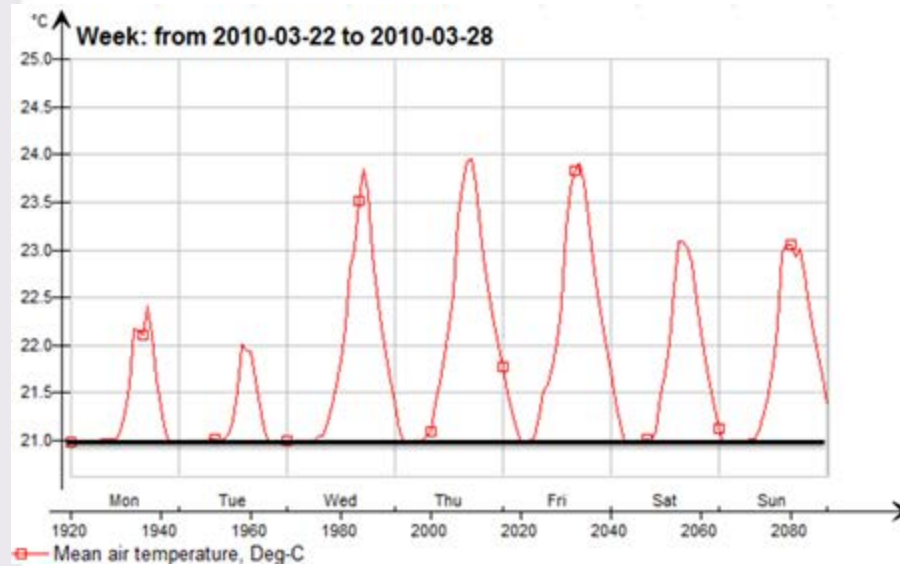


Tallinn/München – 45/35 ja 70/55 temperatuurigraafiku võrdlus

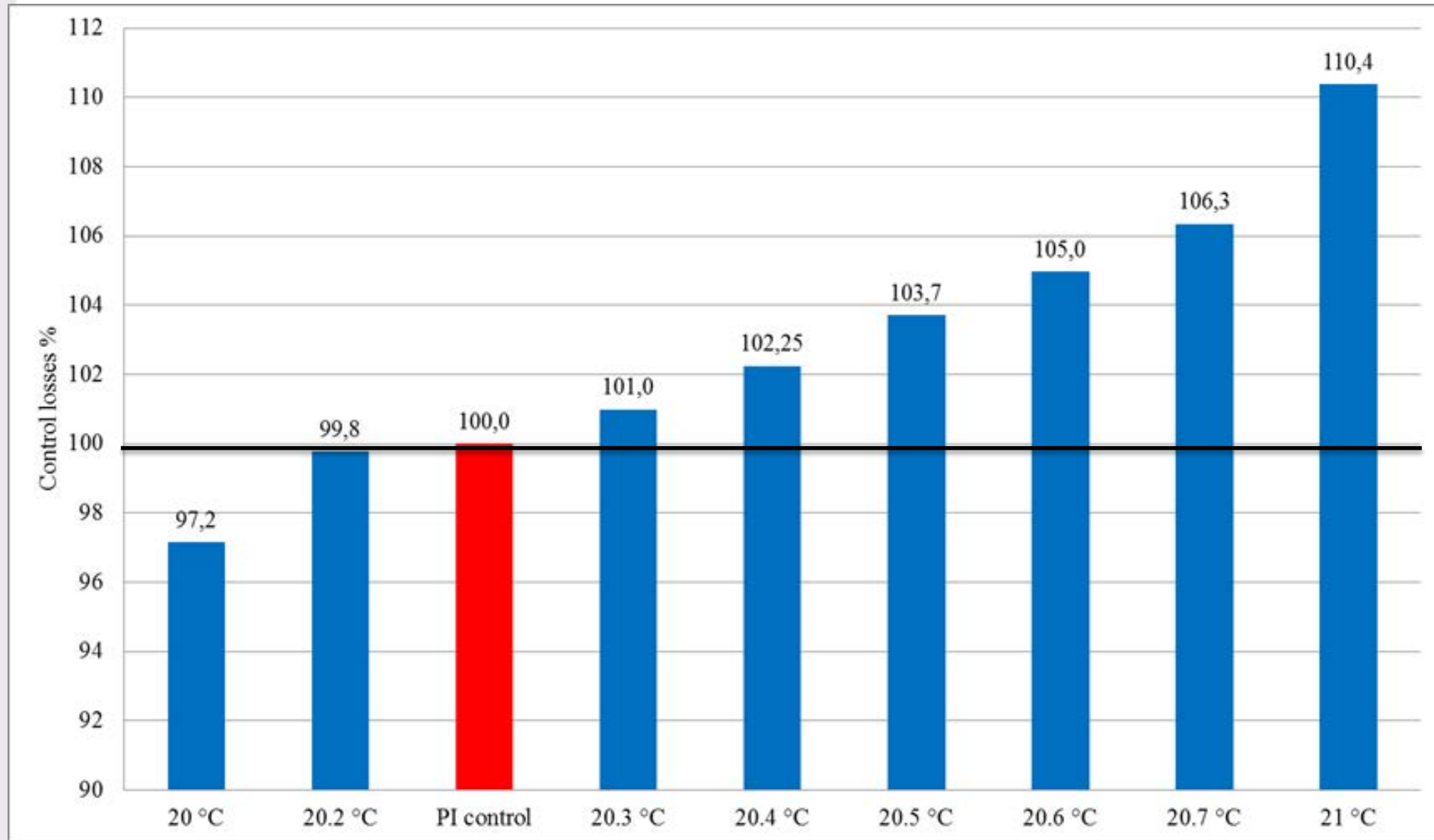




Reguleerimiskaod

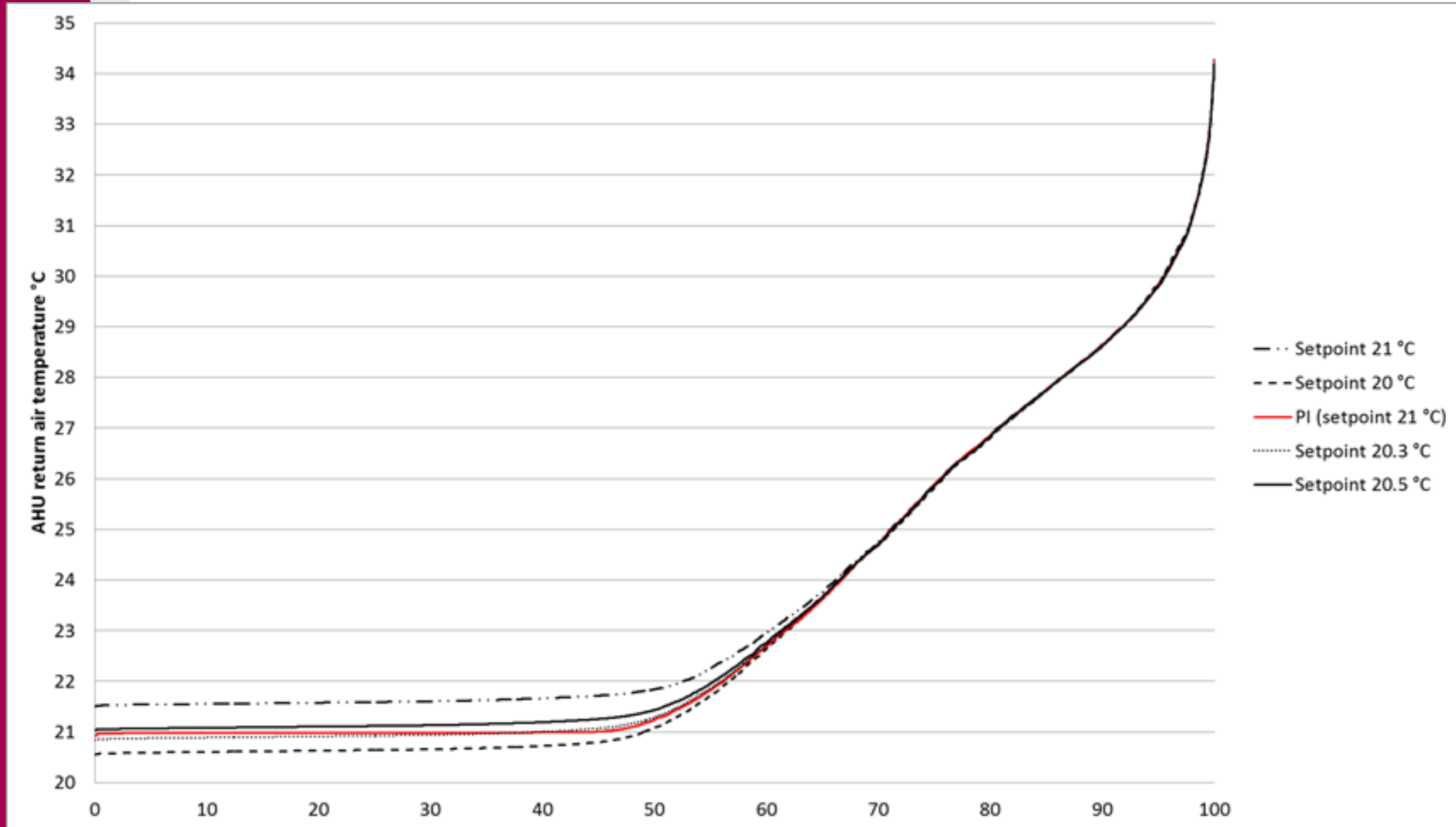


P (parem) ja PI (vasak) kontrolleri mõju ruumiõhu temperatuurile



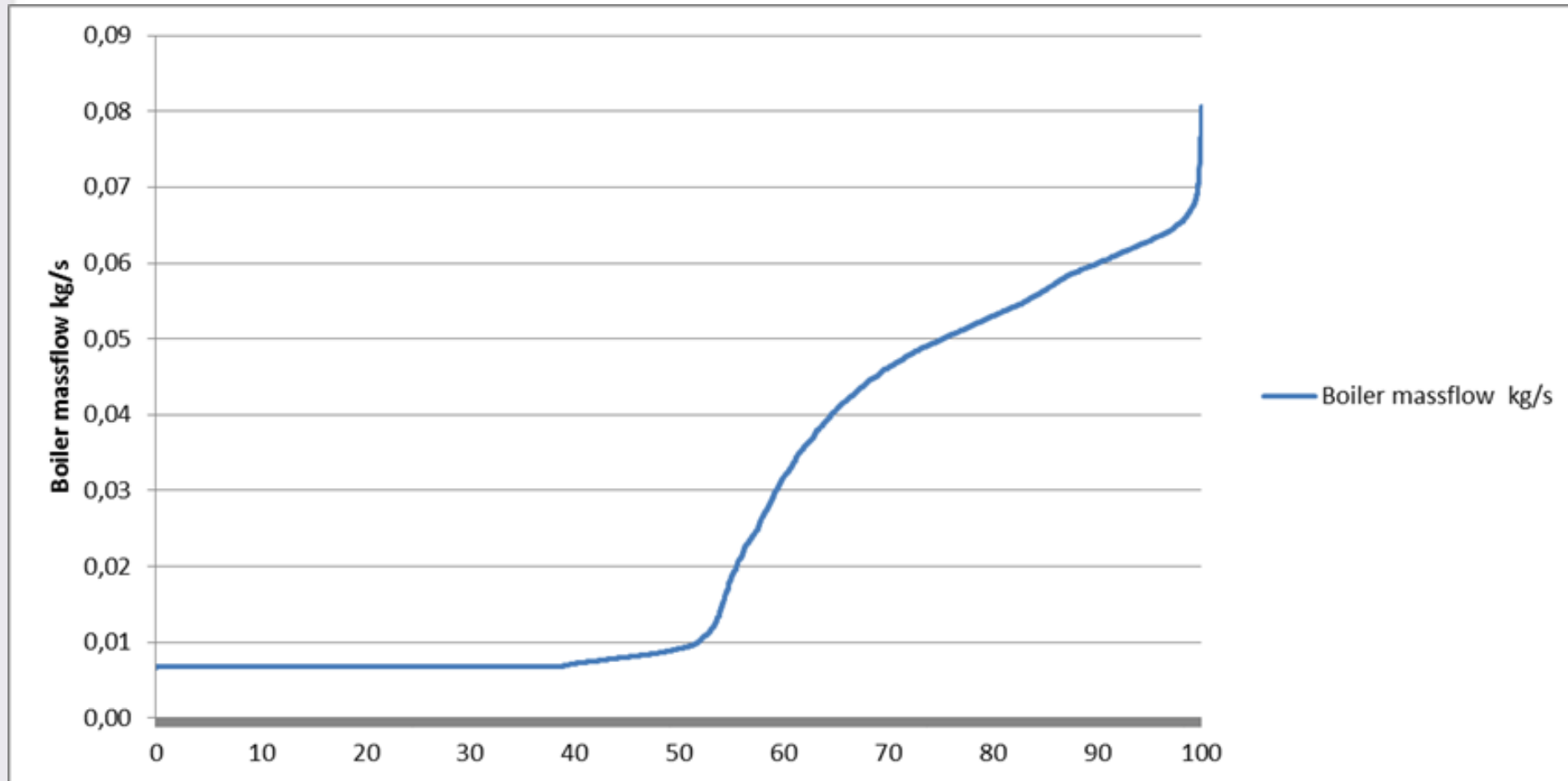


Reguleerimiskaod





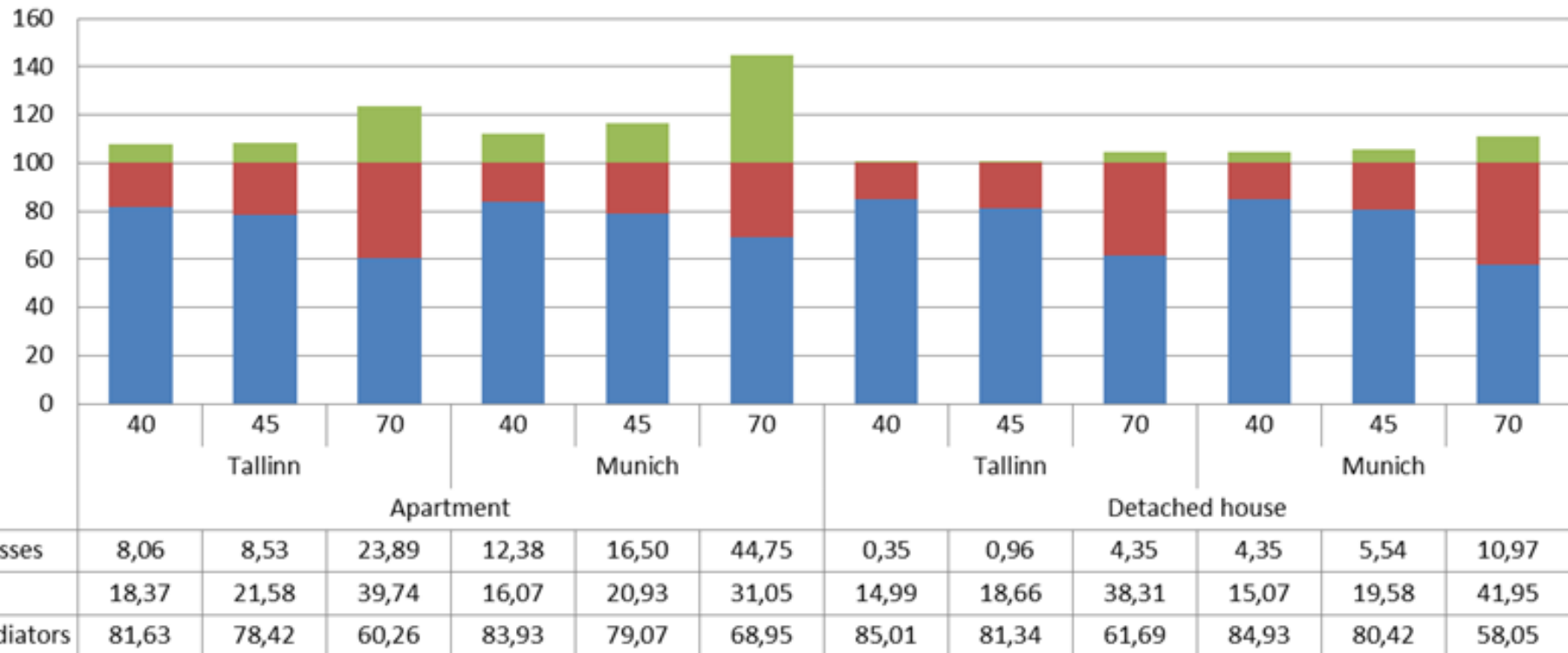
Katla massivooluhulk madala energiatarbega majas



Projekteeritud massivooluhulk – 0.12 kg/s



Küttesüsteemi kaod elamutes:

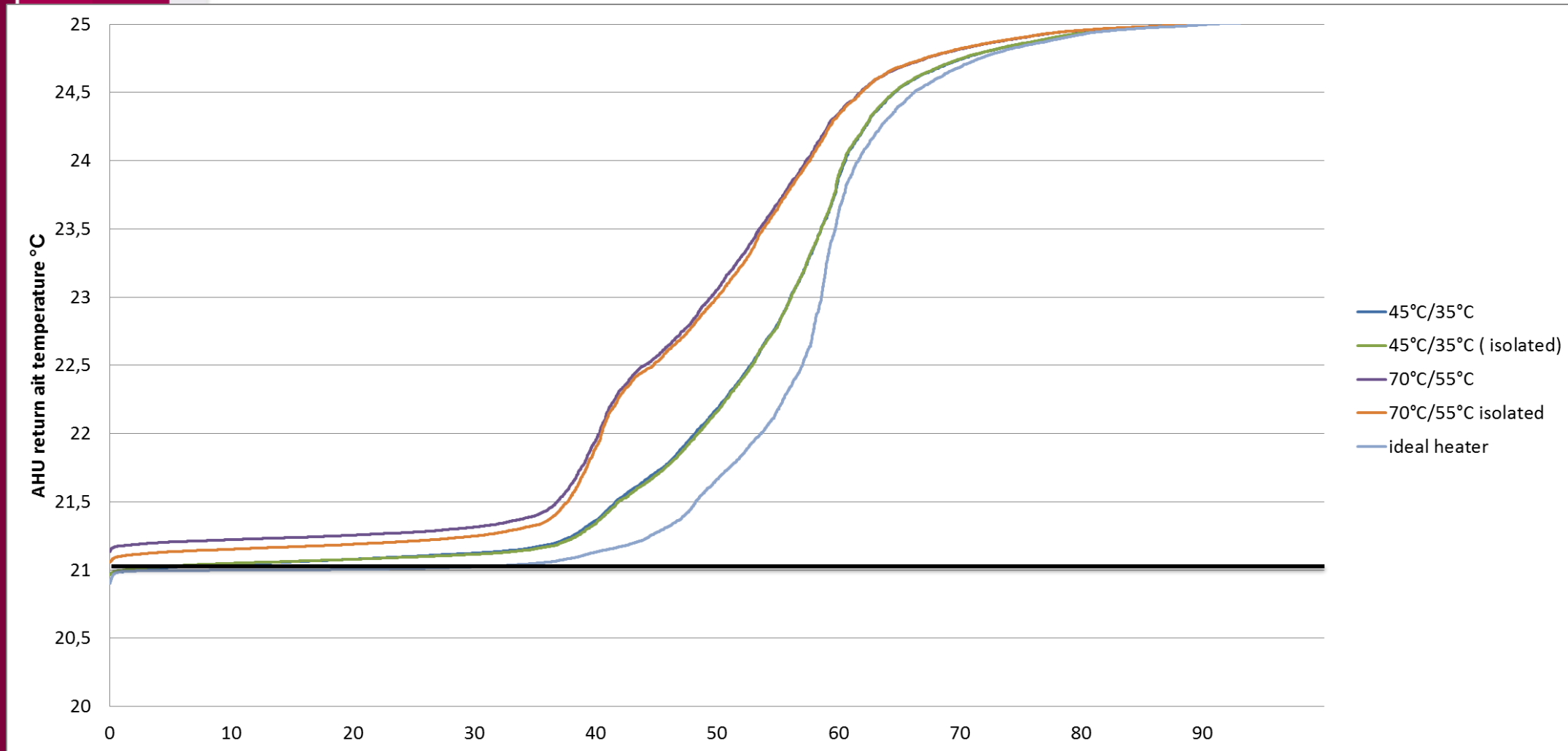


NB! Lisandub reguleerimiskadu! (näites PI reguleerimine!)

P kontrolleri korral täiendav kadu ca 3,7 %!

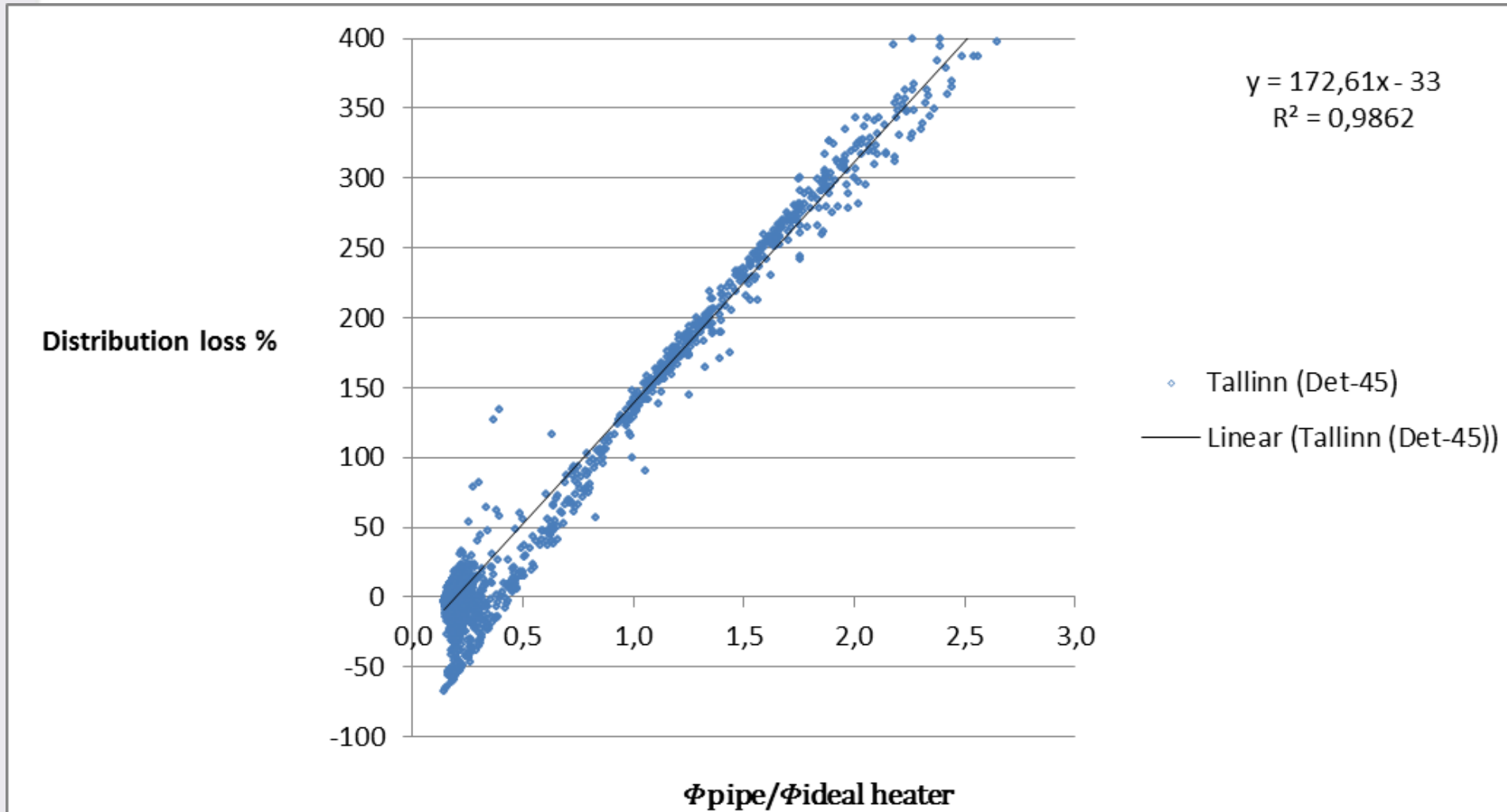


Milles avaldub kadu?





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Kuidas vähendada kadusid?

- Praegu projekteeritavatel korterelamutel kaod ca 30% (70/55 + P termostaadid)

- Soojuseväljastuse kasutegur:
 - Efektiivne termostaat (PI-kontroller)

- Soojusejaotamise kasutegur:
 - Madalatemperatuuriline soojuskandja;
 - Torustiku soojustamine (saavutatav sääst tühine)



Projekteerimisjuhhis

- 45/35 dimensioneerimine sõltumata hoonest;
- Jaotustorustikku köetavas ruumis ei ole mõtet soojustada;
- PI termostaadid annavad täiendava, arvestatava kokkuhoiu;
- Paindlik soojusallikas kõikuvale vooluhulgale – nt inverteriga soojuspump

