WEDNESDAY, APRIL 02. 2025

ARANDELOVAC

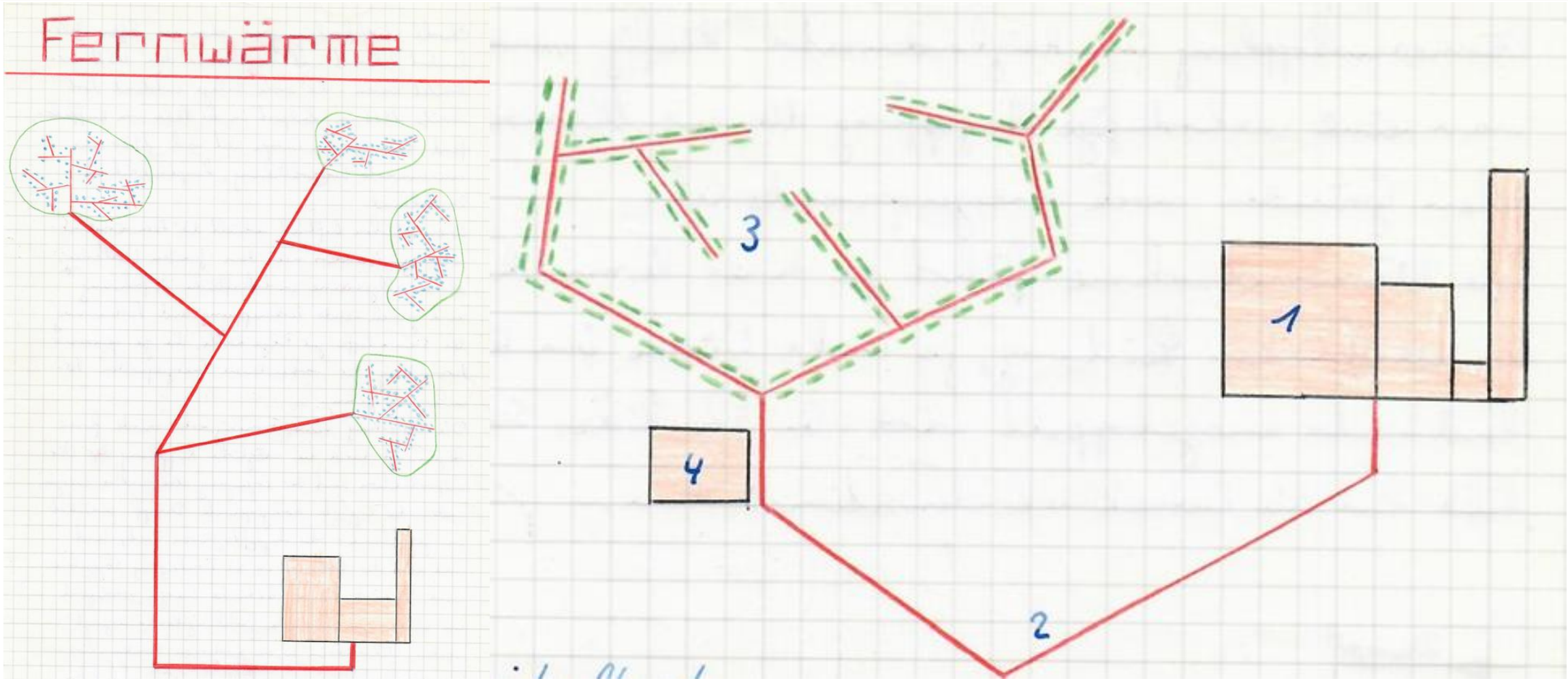
# WTE AND BIOMASS FOR DH IN WINTERTHUR

WALTER BÄNZIGER

# AGENDA

1. Introduction
2. District heating system of Winterthur
3. WtE-Plant
4. DH tunnel Heiligberg
5. Transferstation at Katarina-Place Sulzer
6. Biomass Wasen
7. Future
8. Waste Energy Transport System 1925 at Winterthur

# 1. Indroduction



# 1. Introduction

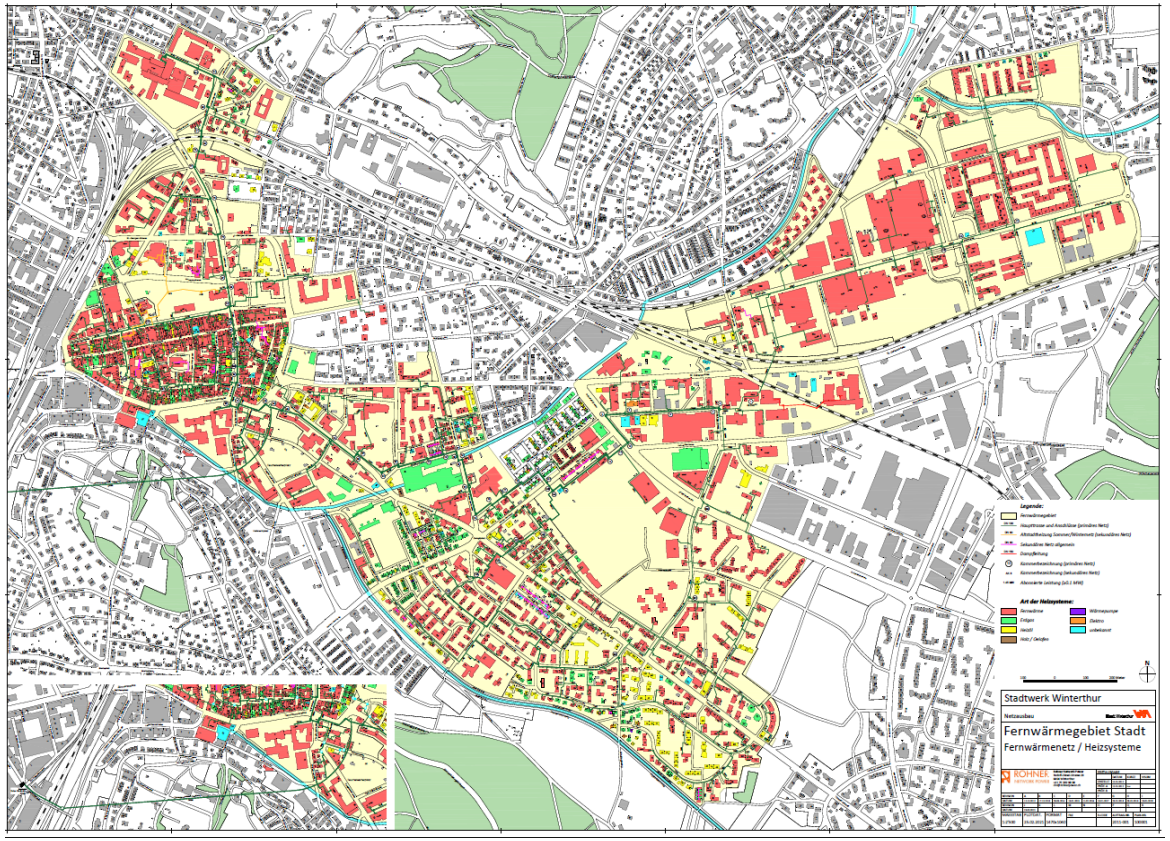
| | |
|---|---|
| Name: | Walter Bänziger |
| Age: | 67 |
| Education: | Postgraduate Studies in Economics |
| | B.Sc. In Mechanical Engineering |
| | Apprenticeship as heating system designer 1975-1979 |
| Business Experiences: | Sulzer (DH, heating systems) |
| | BBC (large PP, combined Cycles) |
| | Chemap (Fermentations) |
| | Von Roll (Incineration plants) |
| | Electrowatt (Incineration plants, PP) |
| | Hug Engineering (catalysts, soot filters) |
| | Pöyry (Incineration plants, PP) |
| | Bänz Consulting (EW-Recycling, Incineration plants, PP) |

# 2. DH-System of Winterthur

City of Winterthur:

- Population: > 120‘000
- DH out from WtE
  - Distance out of WtE: > 50 km
  - Heat transfer stations (HTS): > 800
  - Thermal energy: > 200 Mio kWh/a

- DH out of Biomass and fossil-fired systems
  - Number of add. Heat Center: 5
  - Distance out of Heat Centers: > 25 km
  - Heat transfer stations: > 200



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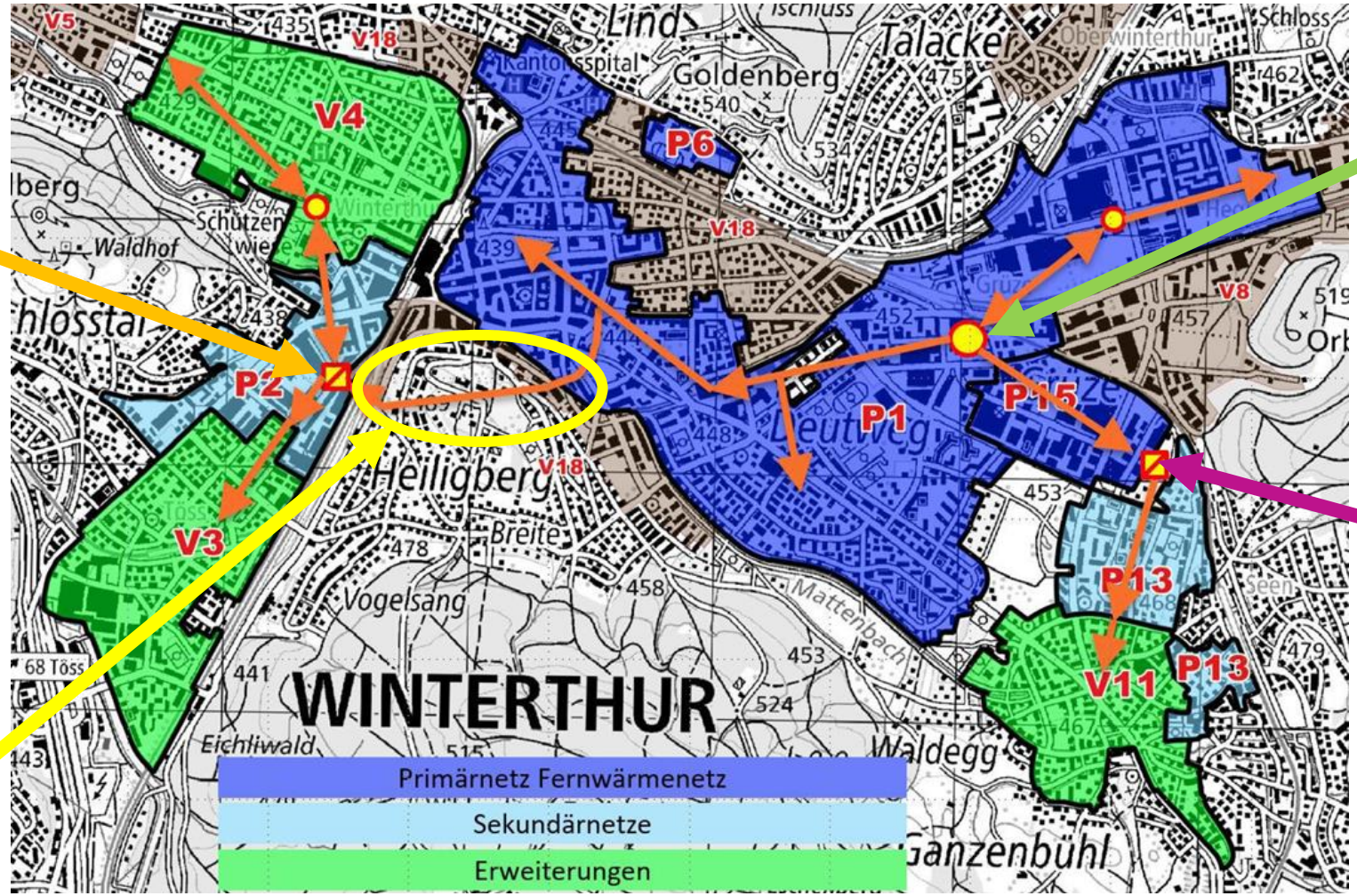


Transferstation

WtE-Plant

DH Waser

DH Tunnel

# 3. WtE Plant Winterthur

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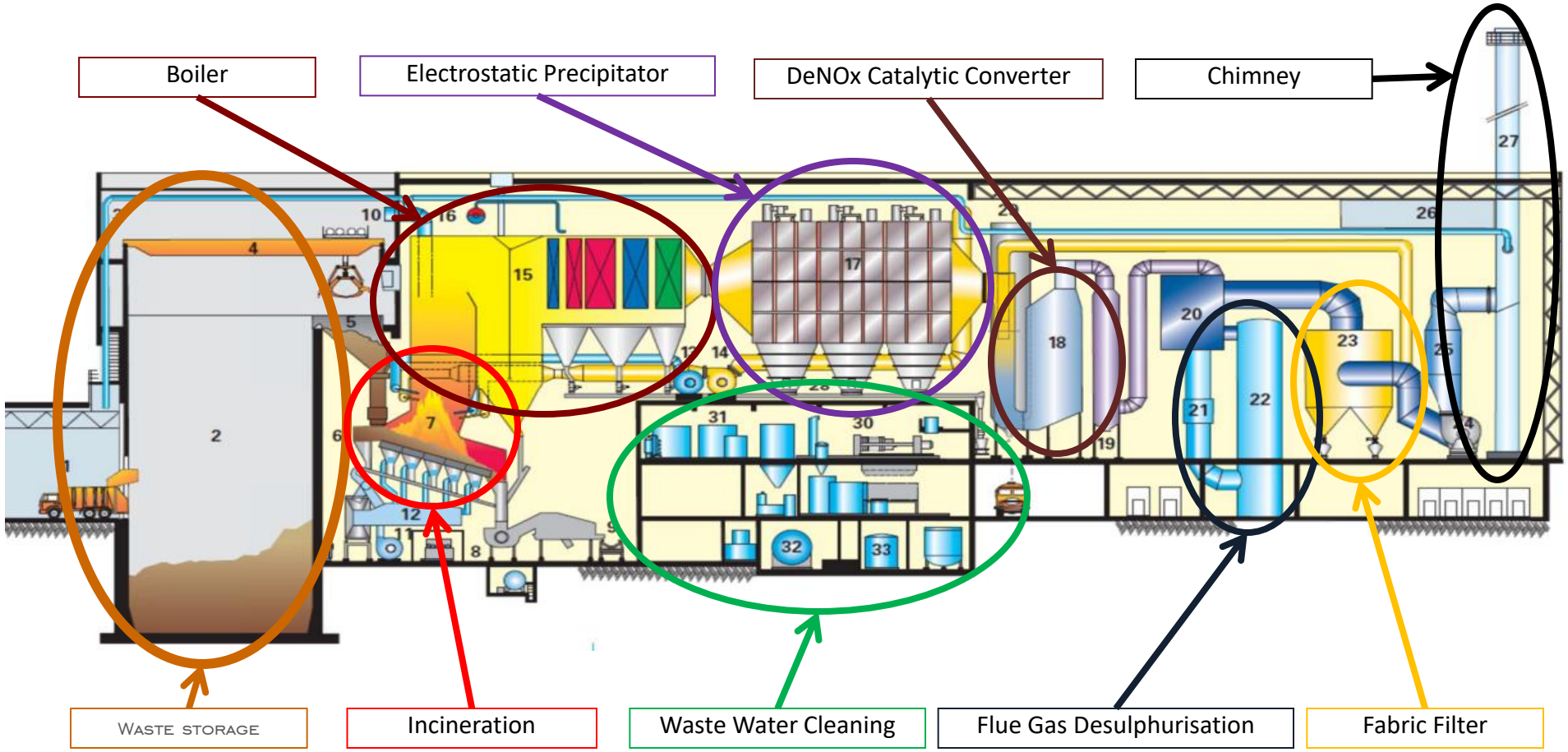
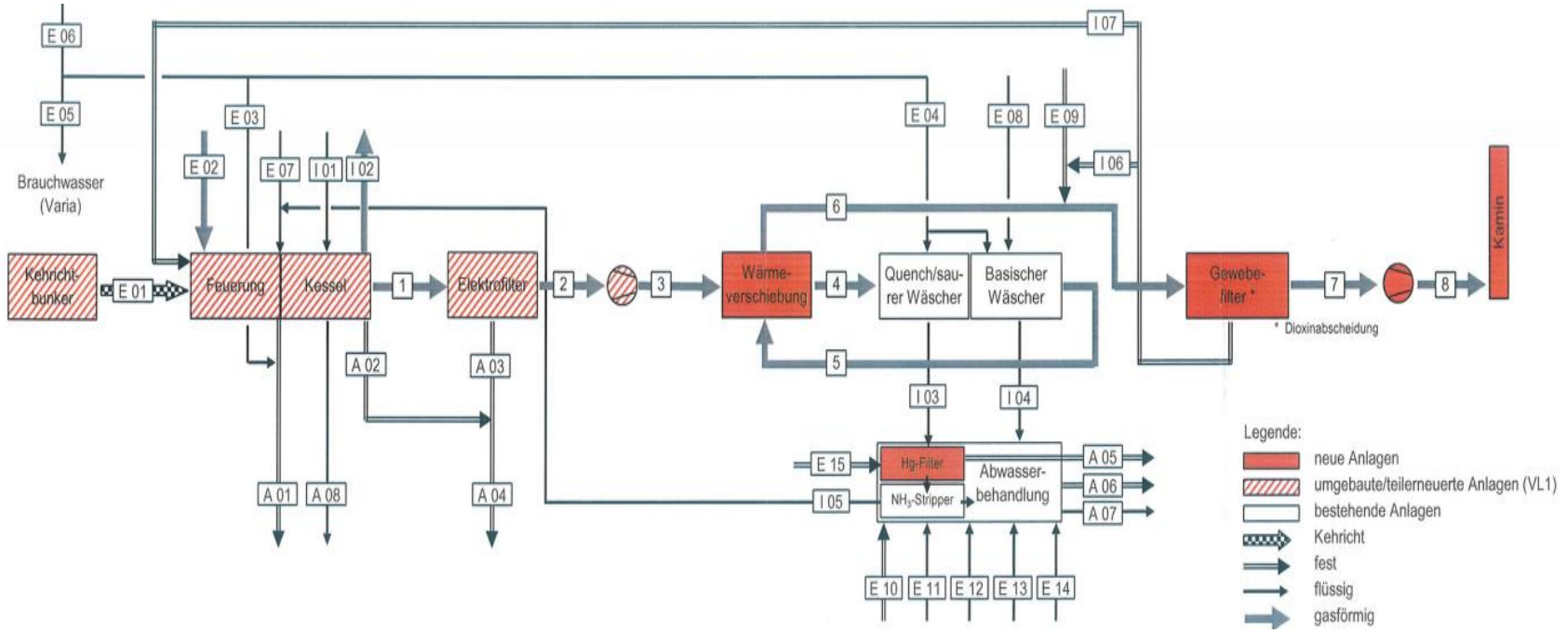
Main Equipment of a WtE plant



# 3. WtE Plant Winterthur

WtE Winterthur is a SNCR Plant

=> NH3 Solution injection into Boiler at temperature window of about 850°C to 950 °C



# 3. WtE Plant Winterthur

Data of WtE Plant Winterthur

**Thermal Power: => ca. 60 MW**
**Electrical Power: => ca. 22 MW**

| Exhaust gas | | Exit Chimney |
|---|---|---|
| Dust | mg/Nm³ | ≤ 2 |
| Lead & Zinc (Pb + Zn) | mg/Nm³ | ≤ 0.02 |
| Mercury (Hg) | mg/Nm³ | 0.05 |
| Cadmium (Cd) | mg/Nm³ | 0.05 |
| Sulphur oxide (as SO2) | mg/Nm³ | 10 |
| Nitrogen oxide (as NO2) | mg/Nm³ | 70 |
| Chlorine compound (as HCl) | mg/Nm³ | 2 |
| Fluoride (as HF) | mg/Nm³ | 0.2 |
| Ammonia (NH3) | mg/Nm³ | 5 |
| Organics (TOC) | mg/Nm³ | 10 |
| Carbon monoxide (CO) | mg/Nm³ | 50 |
| Dioxin / Furans (PCDD / PCDF) | ng/Nm³ | ≤ 0.05 |

# 4. DH Tunnel Heiligberg

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| | | |
|---|---|---|
| Length: | 1060 | m |
| Diameter: | 2.8 | m |
| Wintertime: | | |
| Forw. Temp.: | 130 | °C |
| Ret. Temp.: | 70 | °C |
| Summertime: | | |
| Forw. Temp.: | 85 | °C |
| Ret. Temp.: | 50 | °C |

# 4. DH Tunnel Heiligberg

## Thermal expansion bows

# 5. Transferstation

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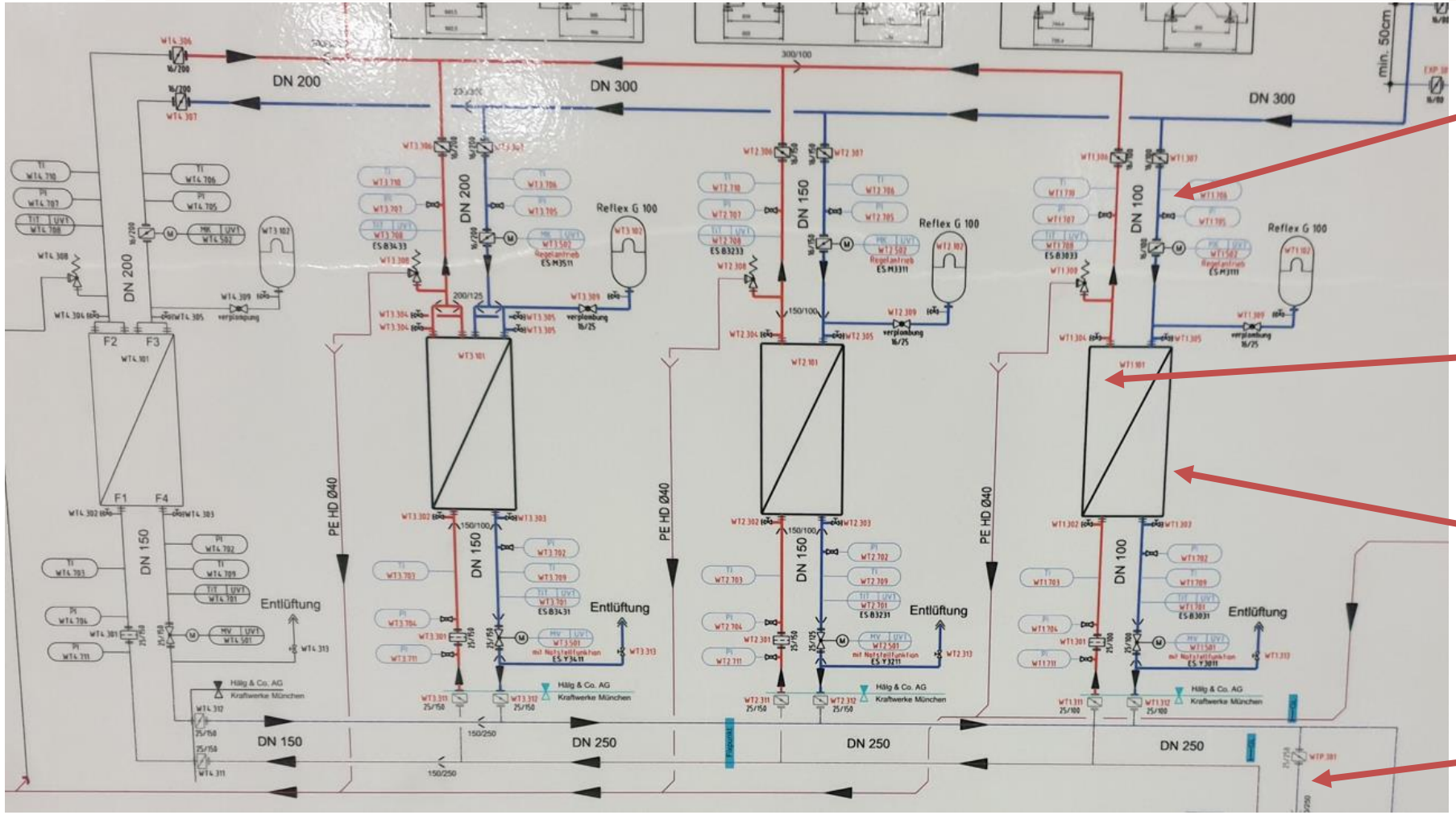


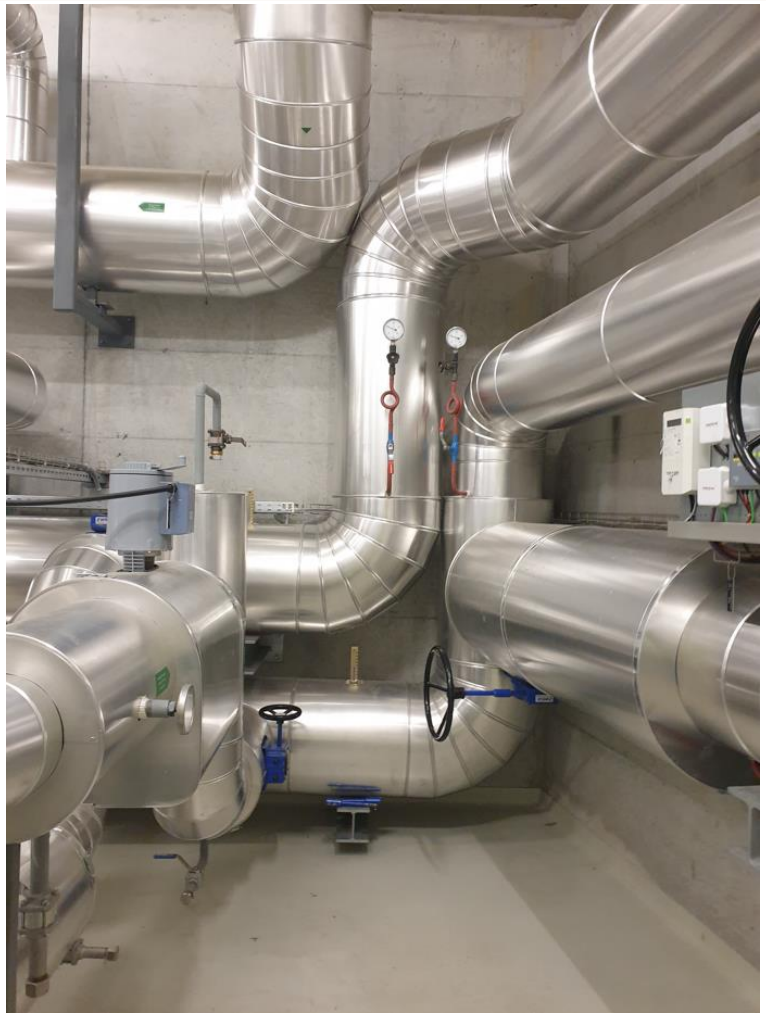

Consumers

Heat Exchanger Secondary Energy

Heat Exchanger Primery Energy

Tunnel

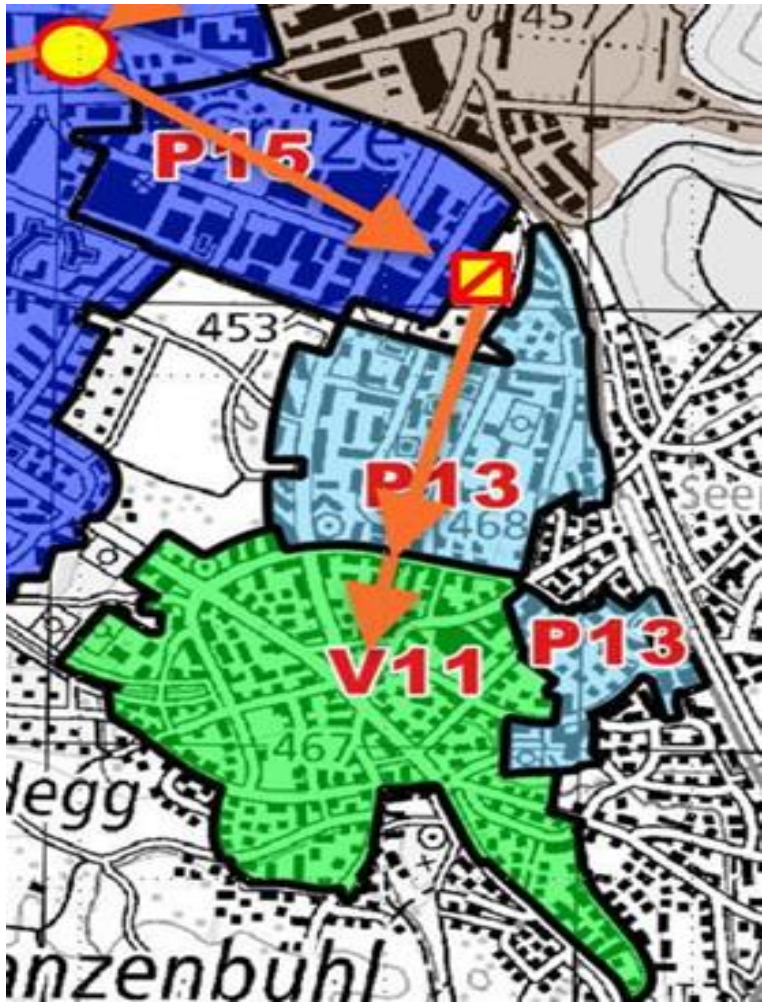
# 5. Transferstation



# 5. Transferstation

# 6. Biomass Plan Wasen

Heatpower at Waser:
Old system; Biomass:
⇒ 2.0 MW woodchip incineration
⇒ 0.9 MW woodchip incineration
⇒ Gasboiler for emergency
New system;
⇒ Heatpower from KVA 7.0 MW at 90/50°C 150 m3/h
⇒ 2.0 MW woodchip incineration
⇒ Gasboiler for emergency



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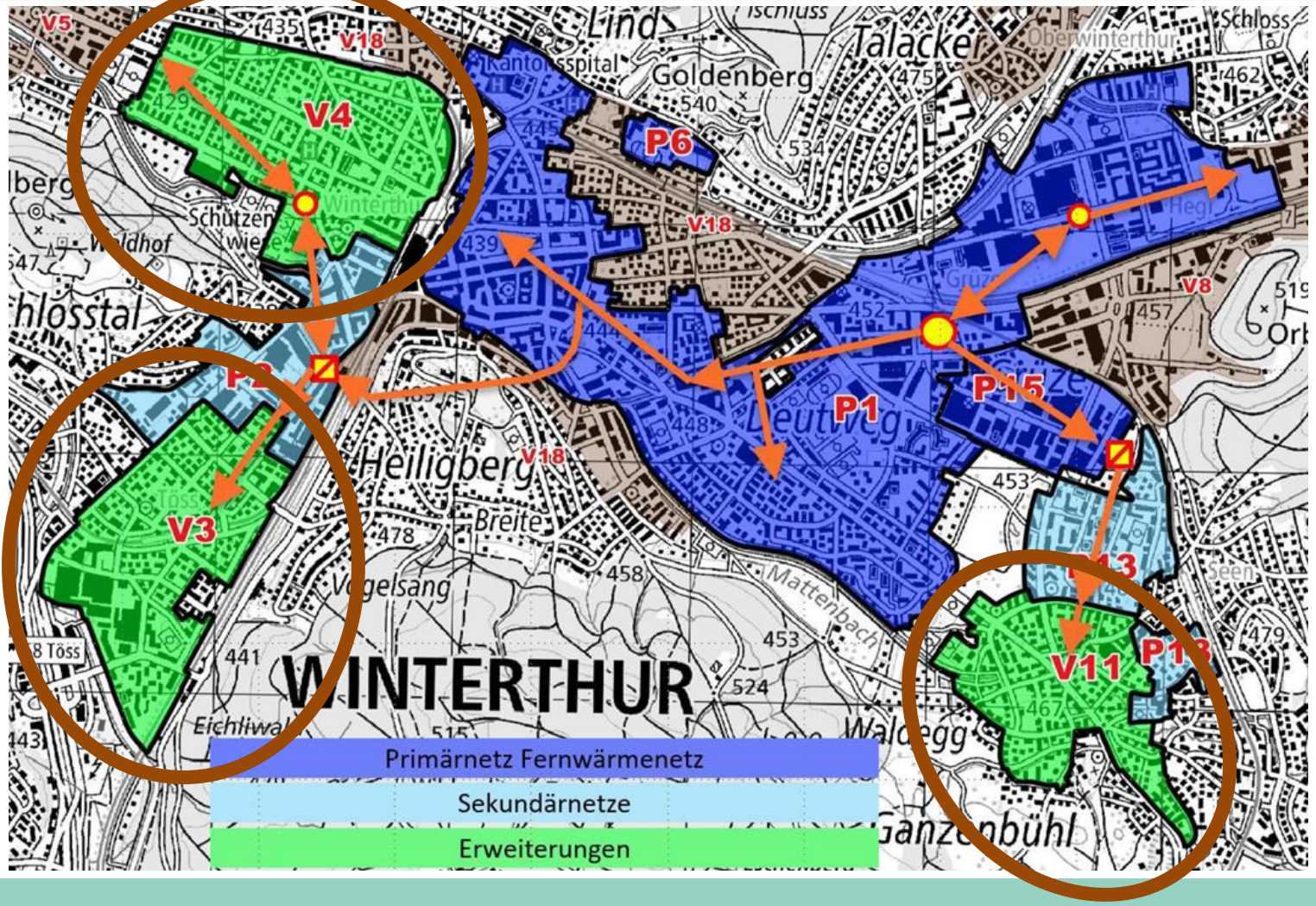
# 6. Future

Veltheim

Töss




Waldegg / Seen

# 7. 1925; Waste Energy Transport System at Winterthur

# Thank you

## Hvala na vašoj pažnji