



On behalf of:



Federal Ministry
for the Environment, Nature Conservation,
Building and Nuclear Safety



of the Federal Republic of Germany

Improving Urban Water Services in Chiang Mai, Thailand using ECAM and SFDs

SFD Exchange Meeting –
Friday, 26 August 2016, 14:00 – 18:00

Astrid Michels, PhD



WATER AND WASTEWATER COMPANIES FOR CLIMATE MITIGATION (WACCLIM)



Joint Initiative between the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the International Water Association (IWA)

On behalf of German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) as part of the International Climate Initiative (ICI)

Global project Partner countries: Mexico, Peru, Thailand and Jordan (new)

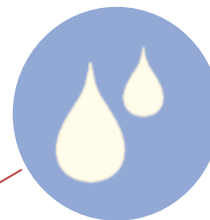
Overall Objective (Outcome) Reduction of emissions through GHG-reducing technologies in water and wastewater companies

Duration 2014 –2019 (5 years)

Budget 6,5 Million EURO for all countries for advisory services

WATER SECTOR IS VERY ENERGY INTENSIVE AND HIGHLY SENSITIVE TO CLIMATE CHANGE

Climate change



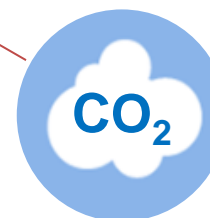
Increasing water demand

- availability ↓40 %,
- demand ↑ 40%



Energy intensive

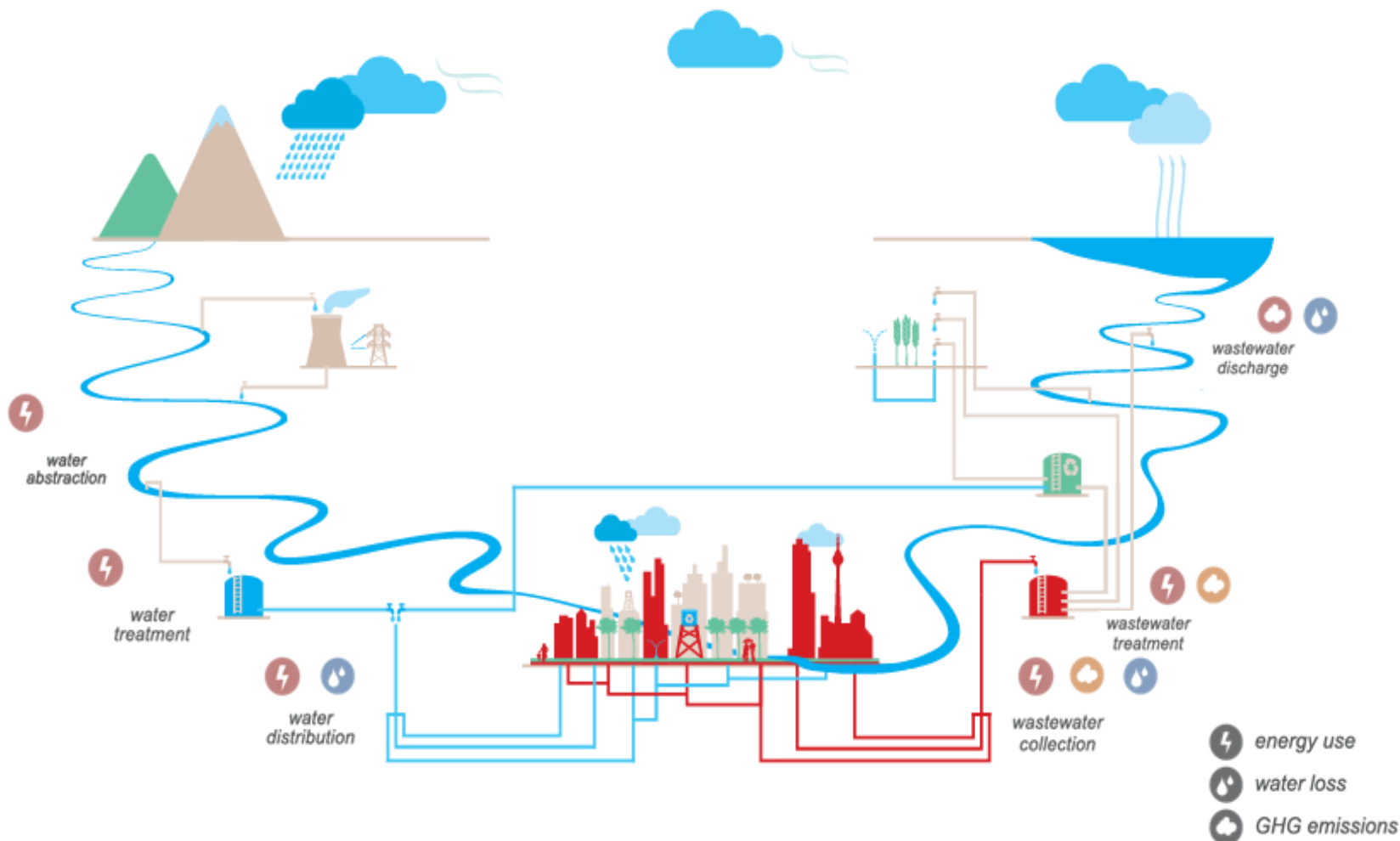
- < 15 % of national energy use
- ≤ 40 % of municipal energy



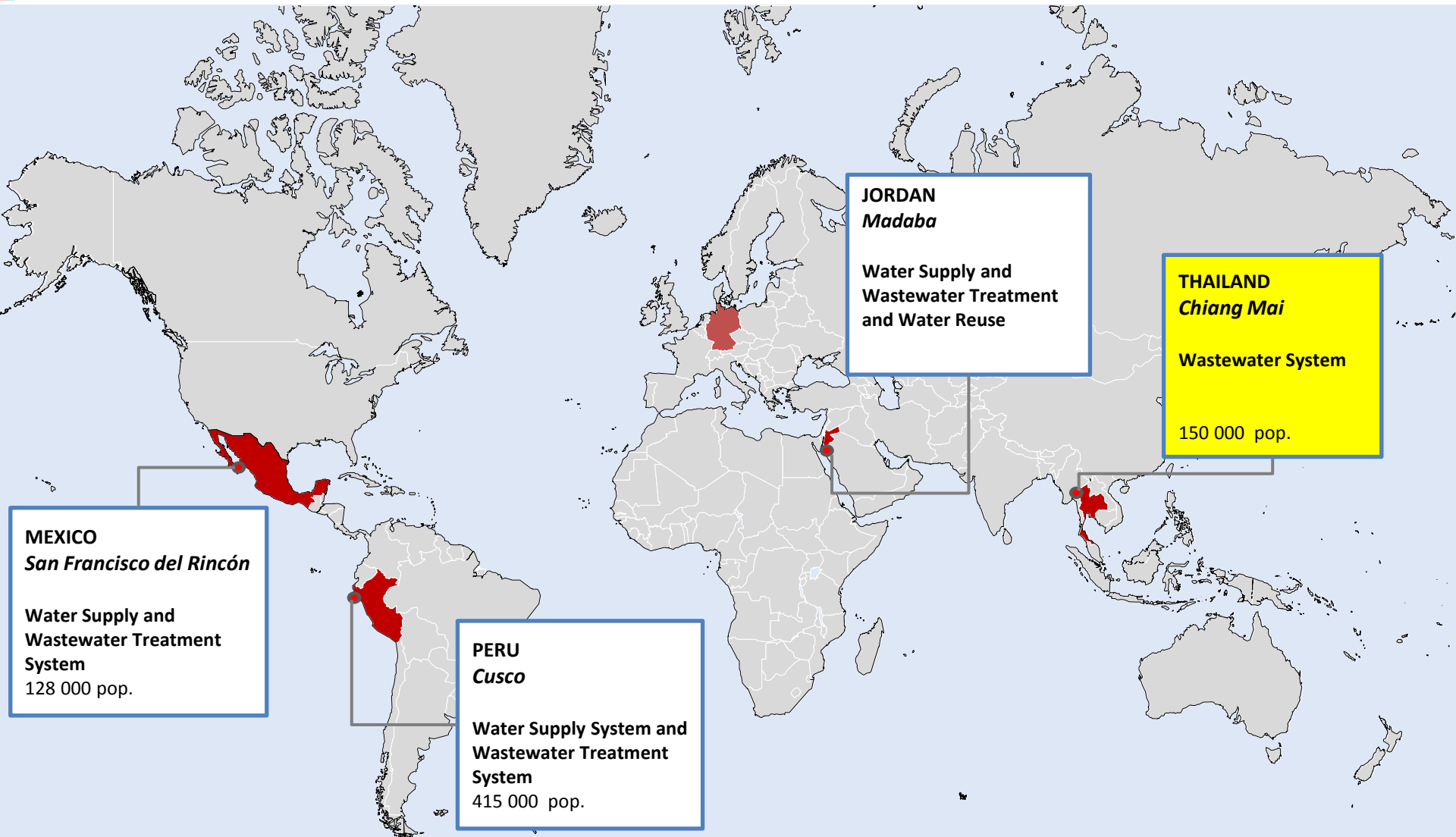
GHG intensive

≈ 3 GtCO₂e globally

INTEGRATED APPROACH TO REDUCING THE ENERGY AND CARBON FOOTPRINT OF UTILITIES



PILOT UTILITIES



WATER SECTOR IN THAILAND

- Climate Change and Water
 - Water scarcity, water deterioration, extreme events
 - severe impacts on humans, society and environment
- Water and Energy: > 40 % of total operational cost
- Chiang Mai:
 - 150,000 inhabitants
 - Tourist destination 5 Mio/a
- Promotion: “Chiang Mai World Green City”



KEY FACTS CHIANG MAI WWTP

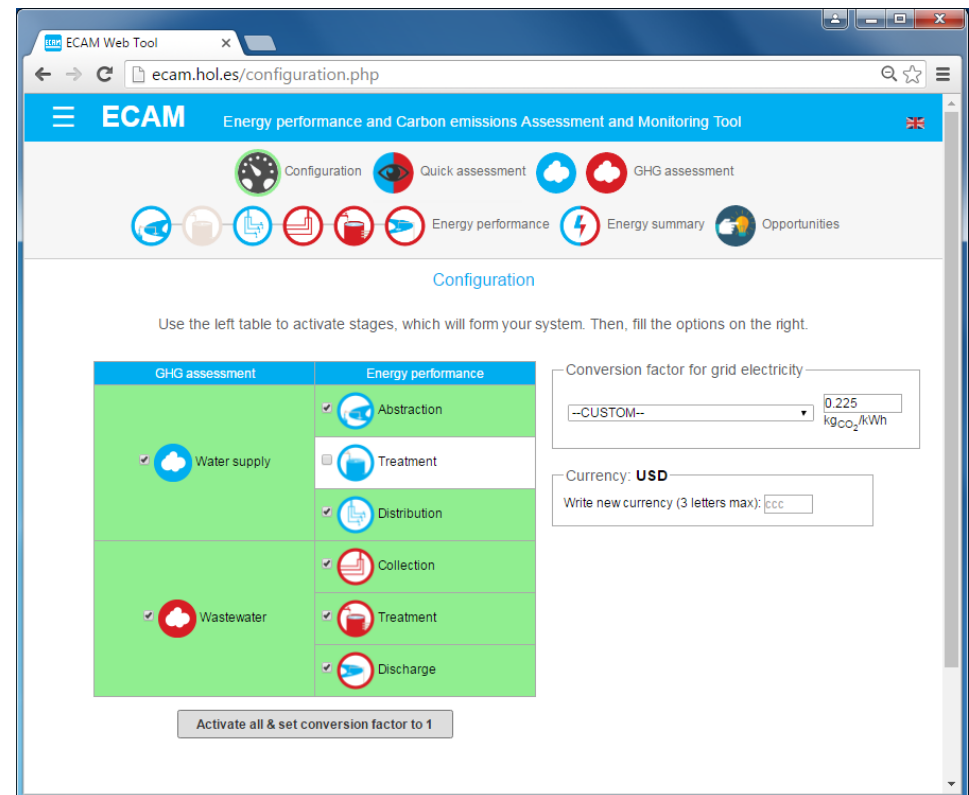
- Septic tank
- Aerated lagoon with 9 pumping stations (PS)
- Low influent flow (**8,000 – 10,000** m³/d) and < 10 % capacity (55,000m³/d)
- Very low organic load (BOD) due to onsite pretreatment

Main focus of WMA:
Energy efficiency and reduction of carbon footprint



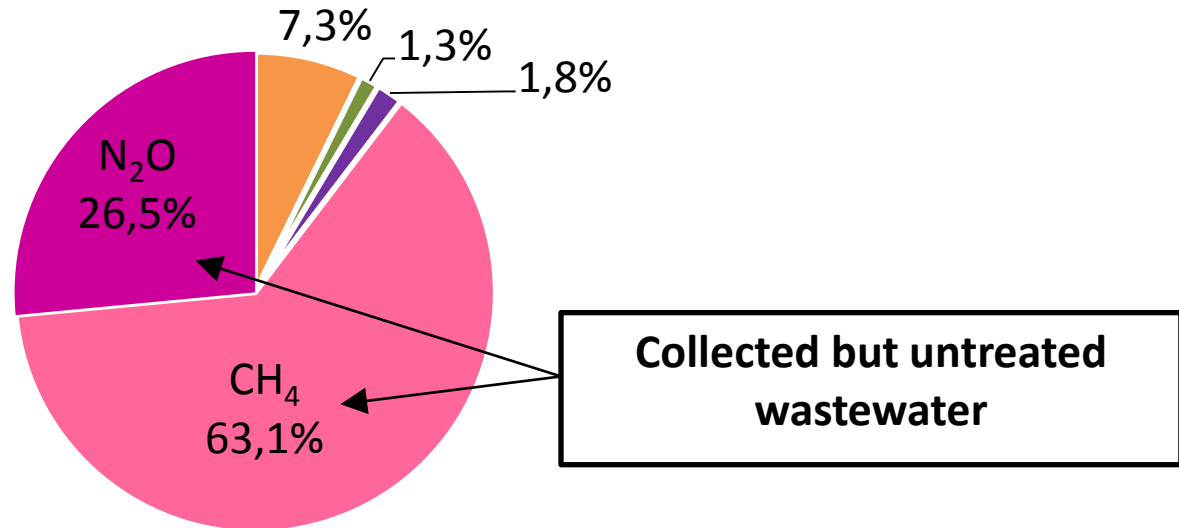
Energy Performance and Carbon Assessment and Monitoring Tool – ECAM Tool

- **Objective:** GHG emission and cost reduction
 - Performance assessment
 - Optimization
 - Progress monitoring
 - User-friendly



Note: Service levels are assessed to provide context to performance indicators and to explain changes

Emissions by sources

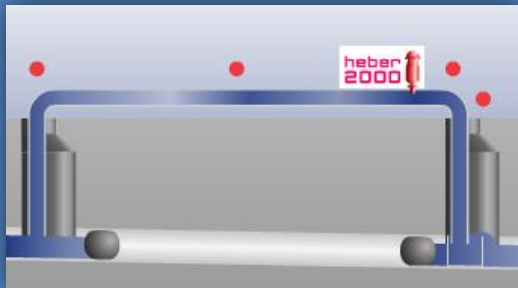


Wastewater (2,081,200)	Electricity		151,000
	Treated wastewater (65,00)	From CH ₄	27,300
		From N ₂ O	37,700
	Untreated wastewater (1,865,200)	From CH ₄	1,313,500
From N ₂ O		551,700	

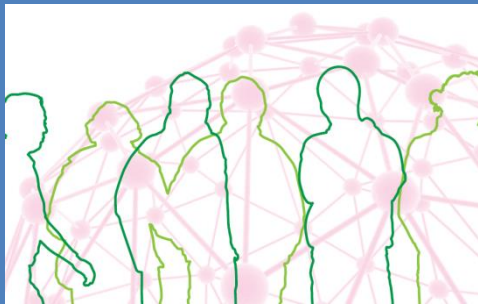
KEY PRIORITIES FOR OPTIMISING CHIANG MAI WASTEWATER SYSTEM



- Energy efficient pumps

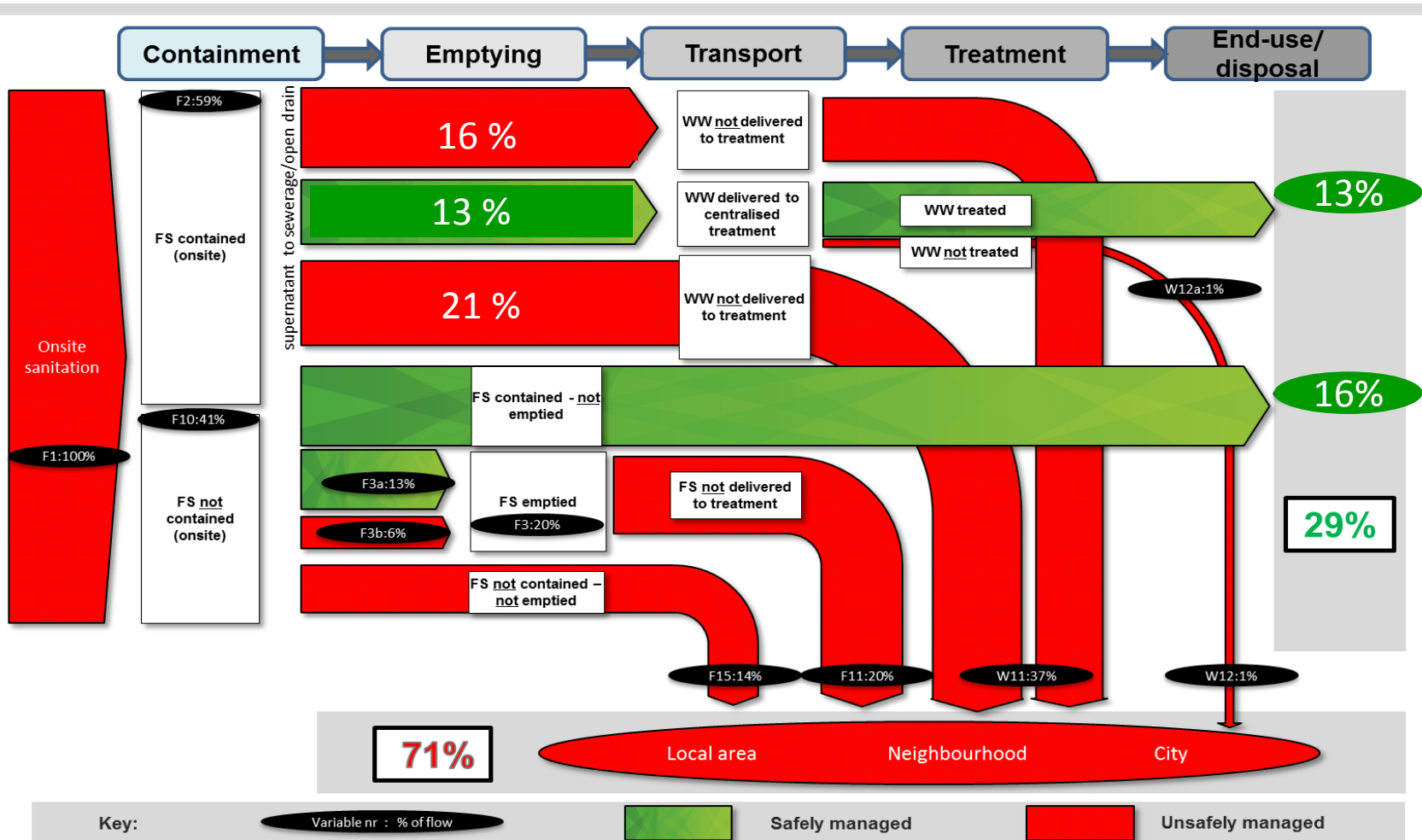


- Reduction of leakage and pipe repair, faecal sludge management



- Stakeholder engagement

SFD DEVELOPMENT FOR STAKEHOLDER DIALOGUE



MITIGATION REQUIRES MAJOR TECHNOLOGICAL AND INSTITUTIONAL CHANGES

Next steps

- Stakeholder workshop in Chiang Mai
- Up-Scaling Approach with 10 + utilities
- Institutional & political framework
 - Policies, capacities & financing mechanisms for low carbon, climate resilient utilities

All sectors need to transform to reach the 2 °C upper target





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THANK YOU!

Astrid Michels
Division for Climate Change,
Environment and Infrastructure

<http://www.iwa-network.org/WaCCliM/>



WHAT ARE THE EXPECTED BENEFITS ?



v	Wastewater
v	1. Untreated wastewater
	Connected population is 75000 people. Serviced population is 12000 people (16%).
	If serviced population was <input type="text" value="25000"/> people (33.33%), it would reduce 384,874.66 kgCO₂ (18.49%) of Wastewater emissions.
v	2. Energy efficiency
	Energy consumption is 321,342 kWh (1,553,298.29 THB). Its related emissions are 151,030.74 kgCO₂ .
	If you reduce energy consumption by <input type="text" value="20"/> %, you can reduce GHG emissions by 30,206.15 kgCO₂ (1.45% of Wastewater emissions) and save 310,659.66 THB (20% of energy costs).