



Waste to Hydrogen KSK



## Get to know company W2H2 KSK

Company W2H2 KSK s.r.o. was founded in 2022 on the basis of memorandum of understanding between Košický self-governing region and company KOSIT a.s.

The target of the joint venture between these two entities is **production of hydrogen** from renewable energy sources using **electrolysis** technology with the use of **heat produced** in the **Waste to Energy plant** to increase the overall efficiency of hydrogen production technology including its **storage** in reservoirs, **transportation** and subsequent preferential **use as a fuel** for suburban buses transport within the responsibility of the Košice self-governing region.

# Memorandum of understanding



## Memorandum of understanding and cooperation between KOSIT a.s. and the Košice self-governing region

Generation, storage, transport and using of hydrogen as a fuel in in public transport (capacity for 50 buses)

Establishing of joint venture 50 % KOSIT and 50 % KSK

Basic assets of joint venture 50 000 €

One part of project will be the PV source of energy

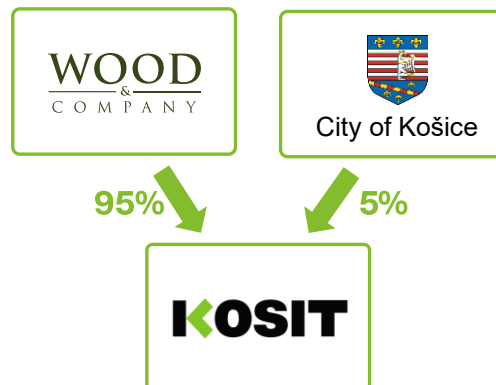
**KOSIT**

**KSK** KOŠICE  
SELF-GOVERNING  
REGION

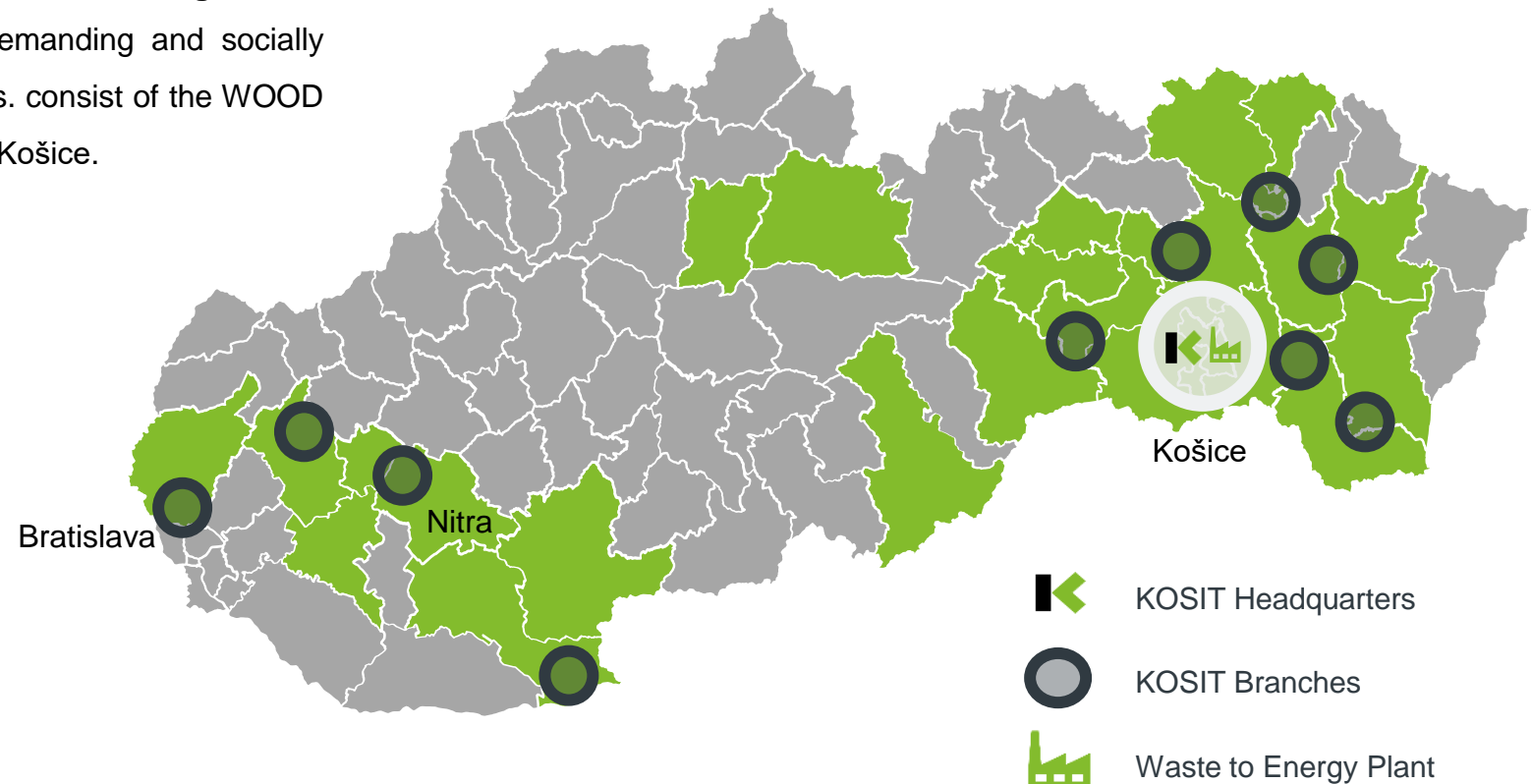
# KOSIT Introduction

**KOSIT was established in 2001.** KOSIT is a technologically innovative company providing professional services in the field of **waste management** for the municipal, industrial and commercial sector, as well as for individual customers. It is one of **the most significant service** providers in Slovakia dealing within demanding and socially sensitive industry. The shareholders of KOSIT a.s. consist of the WOOD & Company Investment Group (95%) and City of Košice.

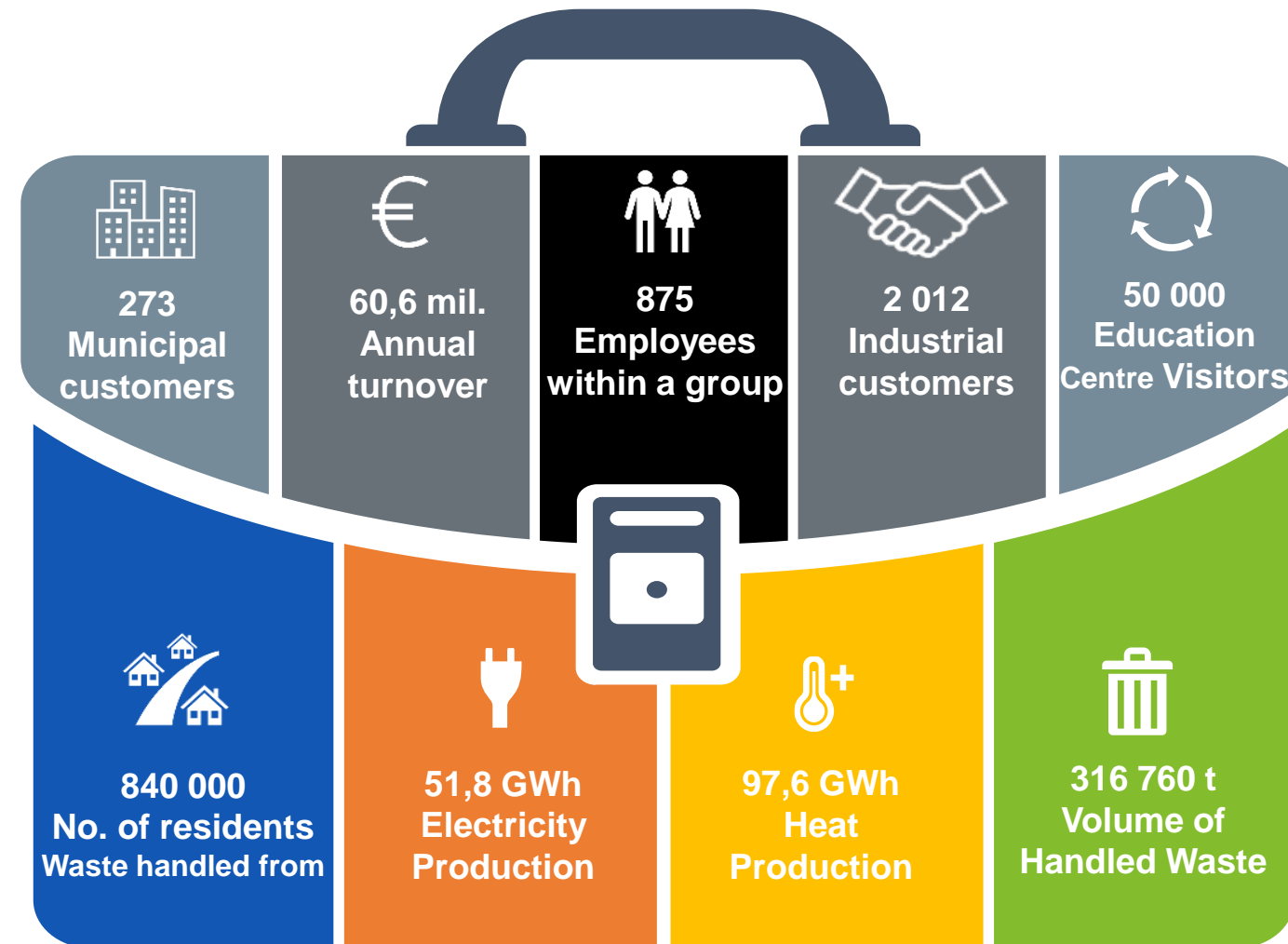
## OWNERSHIP STRUCTURE



## KOSIT IN SLOVAKIA



# KOSIT Introduction



## REFERENCES





# KOSIT Waste to Energy Plant

## Current status: Line K1 a K2

Grate incinerator for MSW with energy recovery

Capacity the both lines K1 + K2:  
20 t waste per hour

Boiler output: K1 20,9 MW a K2 24 MW

Heat production (K1 for DH) : 50 GWh<sub>t</sub>/year  
Power production (K2) : 40 GWh<sub>e</sub>/year

## Future: Line K3

State-of-the-art grate incinerator for MSW

Capacity of line: 12,5 t waste per hour

Boiler output: 35 MW<sub>t</sub> (CHP)

Heat production: 53 GWh<sub>t</sub>/year  
Power production: 49 GWh<sub>e</sub>/year



Circular Economy  
Principle



Energy Recovery



4.000  
Households



20.000  
Households

# KOSIT BioGas Plant

Treatment of biodegradable waste, kitchen waste included

Heat supply: 2 GWh/year  
Power supply: 6,5 GWh/year

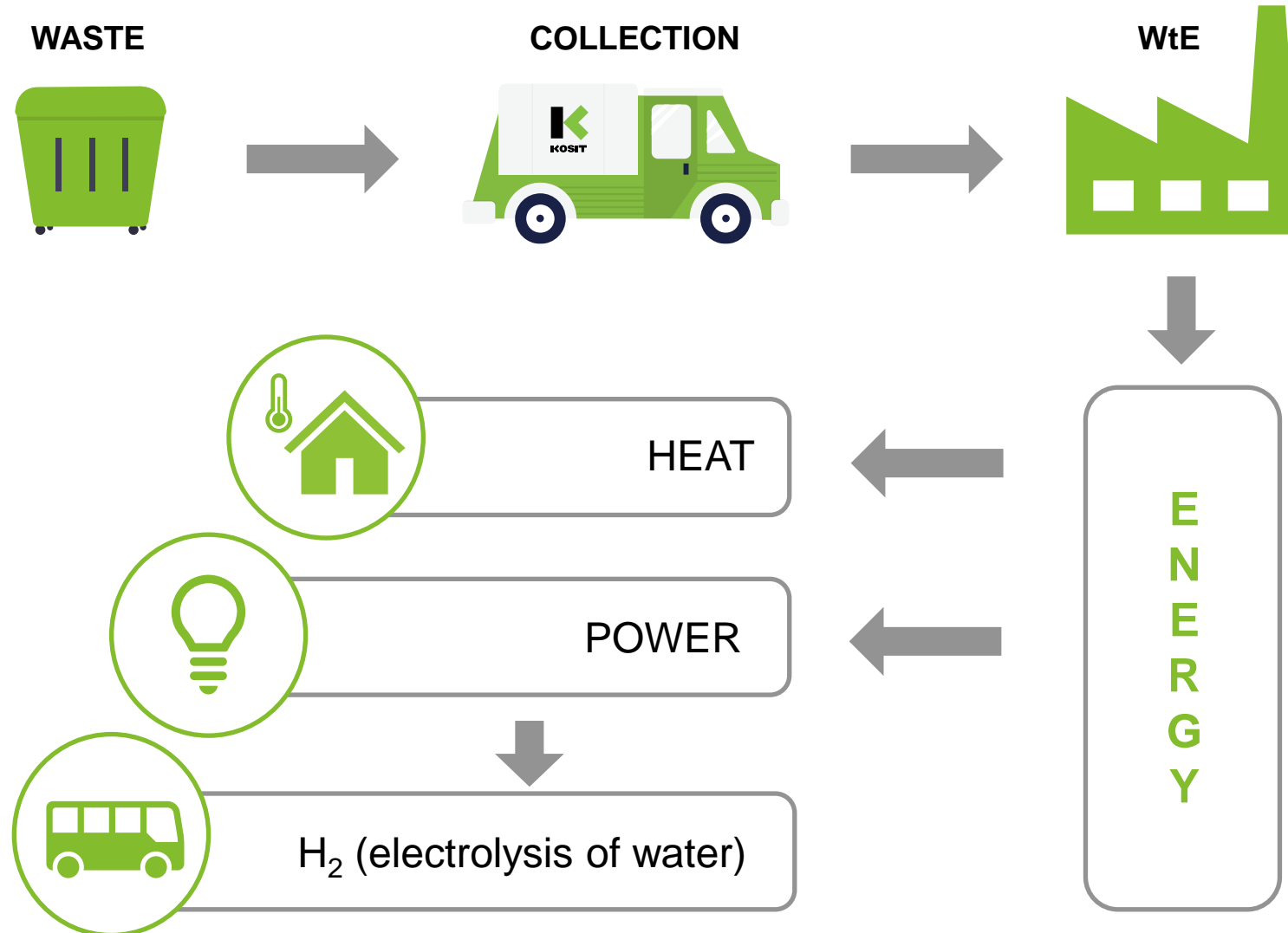
Cogeneration unit output: 1 MW (CHP)

Waste input: 30 000 t/year





# Production of Hydrogen in WtE Plant





# Production of Hydrogen in WtE Plant

	SOEC Electrolyser	PEM Electrolyser
<b>Power Input of electrolyzers (AC)</b>	1,1 MWh/400 V	1,1 MWh/400 V
<b>Output of electrolyser</b>	318 Nm <sup>3</sup> /h, 28,58 kg/h	200 Nm <sup>3</sup> /h, 17,97 kg/h
<b>Output Pressure</b>	1,7 Bar	30 Bar
<b>External Heat - Steam</b>	260,6 kg/h @ 250°C	-
<b>Power Consumption</b>	3,5 kW/Nm <sup>3</sup> H <sub>2</sub>	5.1 kW/Nm <sup>3</sup> H <sub>2</sub>
<b>Hydrogen purity</b>	99,995 %	99,998 %
<b>Oxygen purity</b>	-	99,5%
<b>CAPEX</b>	3,5 mil. €	2,5 mil. €



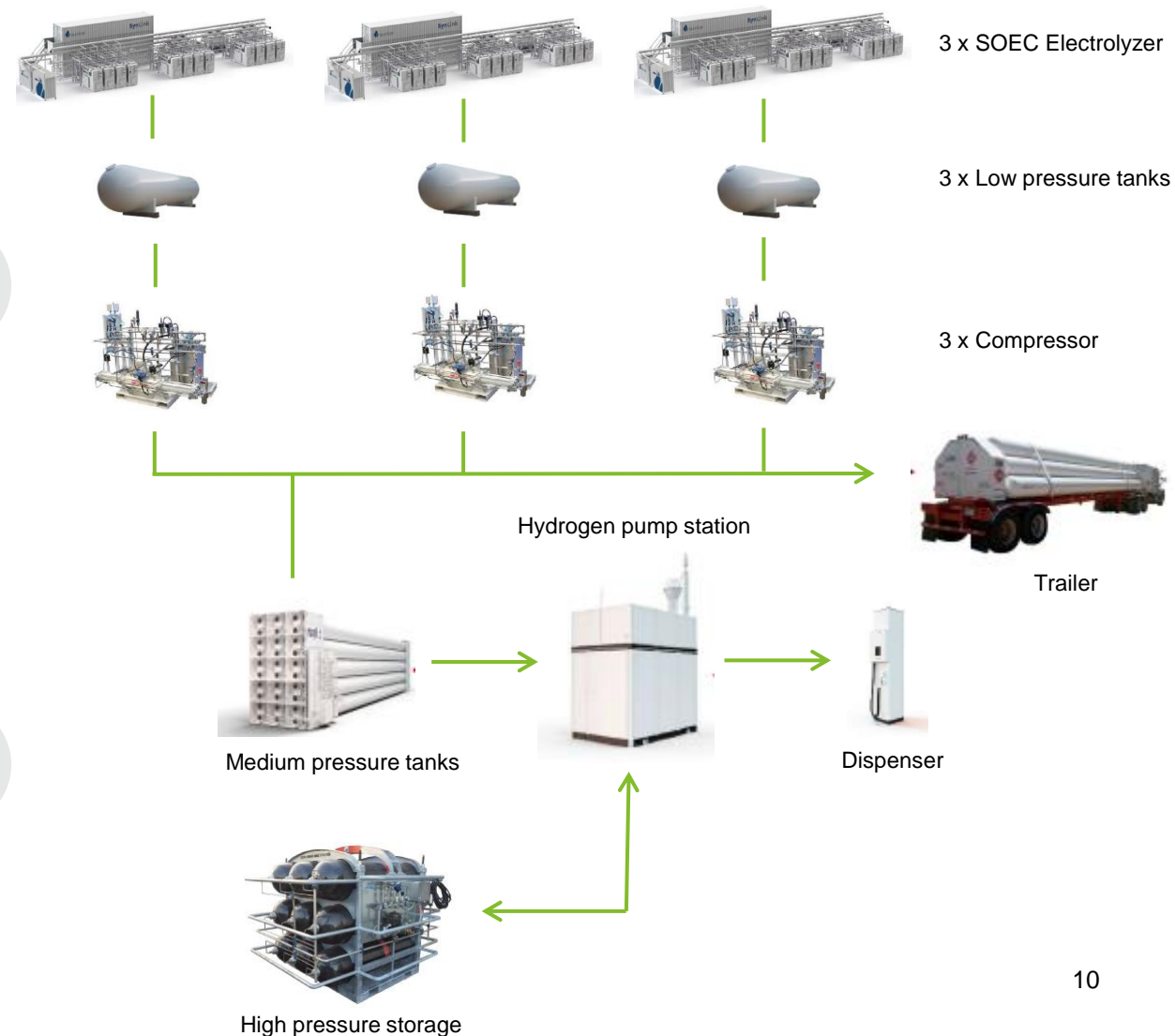
# Production of Hydrogen in WtE Plant

Type of electrolyzer : 3 x high temperature electrolyzer SOEC

Power input: 3 x 1,1 MW

Power output of electrolyzers:  $318 \text{ Nm}^3/\text{h} \approx 28,58 \text{ kg H}_2/\text{h}$   
 $\approx 685 \text{ t/year}$

Capacity of storage tanks: 2 x 3000 kg



# Production of Hydrogen in WtE Plant



# Time Plan

		2022		2023				2024				2025			
		3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
MoU & JV KSK + KOSIT	3 Mo														
Feasibility study	20 Mo														
Plot Acquisition	6 Mo														
EIA	9 Mo														
Zoning Permit & Construction Permit	12 Mo														
EPC Tender	5 Mo														
Construction	24 Mo														
Trial Operation	12 Mo														
Start of Operation	-														



# Financial Instruments of the Project

## Co-financing of project from the public funds



**Funded by  
the European Union**



