

Zlín Region, Czech Republic

Waste incinerator upgrade in Uherské Hradiště hospital

DESCRIPTION OF THE ACTION

Uherské Hradiště hospital is one of four regional hospitals established by the Zlín region. In recent years the massive reconstruction of the whole hospital are is taking place and increasing the capacity of the existing waste incinerator is one of the considered measures which would improve the economy of the hospital as well as contribute to the energy efficiency of the region and reduction of the waste disposed in landfills.

The project outlined should resolve the upgrade of the currently technically and morally obsolete device of hospital waste incinerator in the hospital area.

The case study and financial analysis is serving as a necessary basis for investor in his decision-making process in case increasing of the capacity of the existing hospital waste incinerator. The investor (the Zlín Region) is considering to increase the capacity from actual capacity 300 tons/year to 500 tons/year, eventually up to 1000 tons/year.

The incinerator will dispose the waste produced by the hospital as well as by other external sources of combustible waste. The supporting fuel is natural gas and this source will be preserved. There are two scenarios considered:

- scenario A with annual processing capacity of waste in amount of 500 t/year
- scenario B with annual processing capacity of waste in amount of 1.000 t/year

Time period: 2018 - 2019

Key results:

- Hospital will have upgraded and modernized its source of heating which will ensure heat supply
- Hospital will improve its economy and self-independence in energy supply
- The amount of combustible from sources outside the hospital waste will be reduced



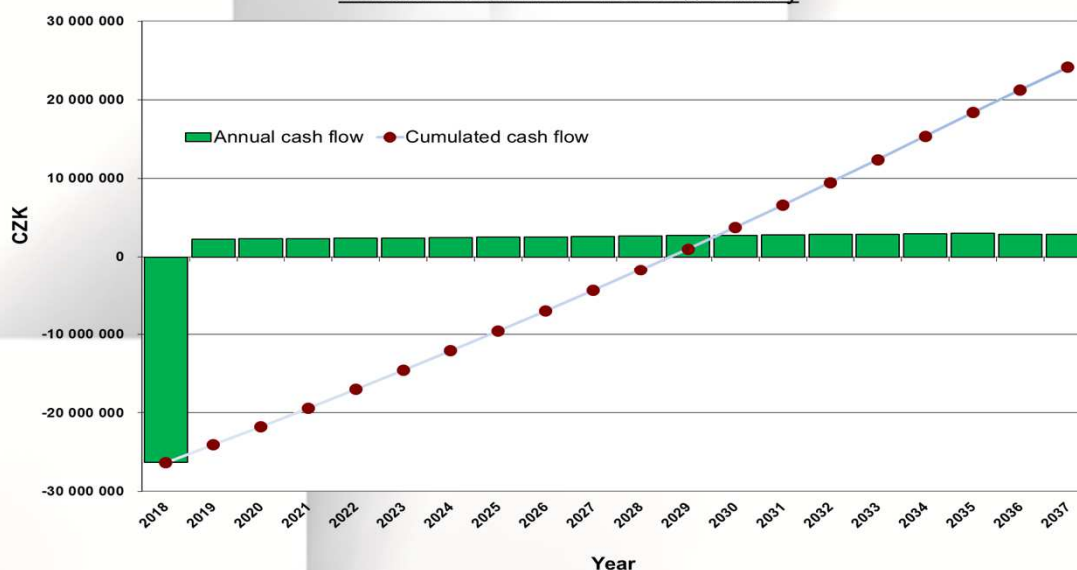
FINANCING

**Scenario A - Annual processing capacity of waste incinerator is 500 t/year
 (30% subsidy)**

Investment costs	38.500.000 CZK (1.540.000 EUR)
- Own sources – 70%	26.950.000 CZK (1.078.000 EUR)
- Subsidies (OP Environment) – 30%	11.550.000 CZK (462.000 EUR)
- Loans	0,- CZK
Lifetime (service life)	20 years
Annual operational costs (salaries, repairs, maintenance etc.)	3.400.000 CZK (136.000 EUR)
Annual revenues	5.800.000 CZK (232.000 EUR)
- Thermal energy	2.300 000 CZK (92.000 EUR)
- Waste	3.500 000 CZK (140.000 EUR)

Financial indicators	
Net present value - NPV	11 208 366,07 CZK
Internal rate ratio - IRR	7,13%
Payback period - simple	11 years
Payback period - discount	13 years
Evaluation year	2018
Lifetime period	20 years
Discount	3,00 %

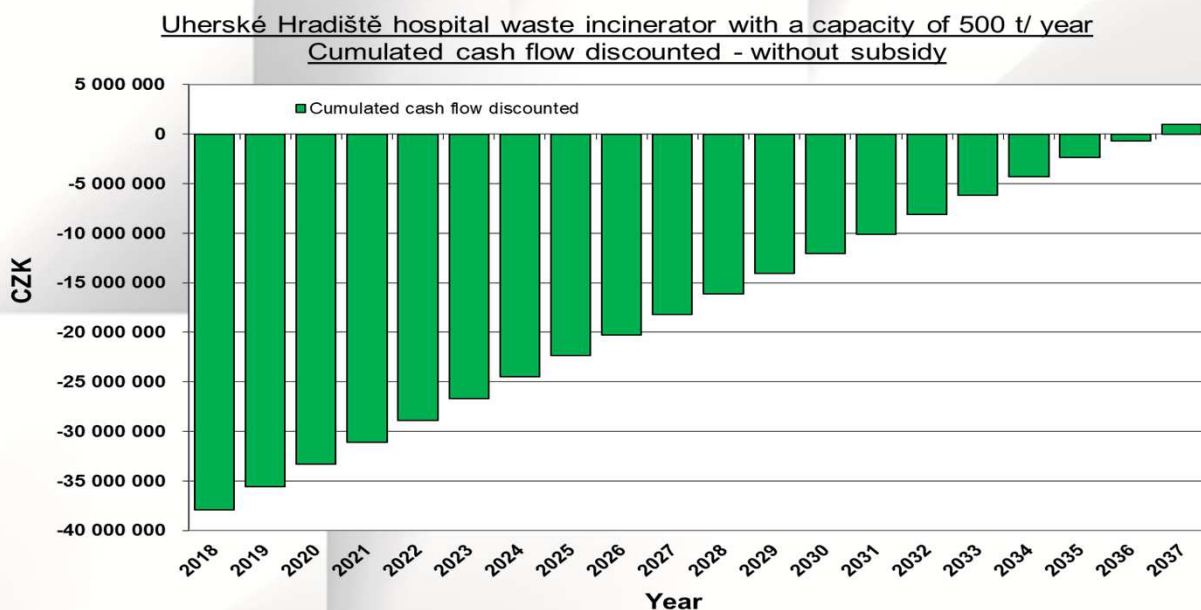
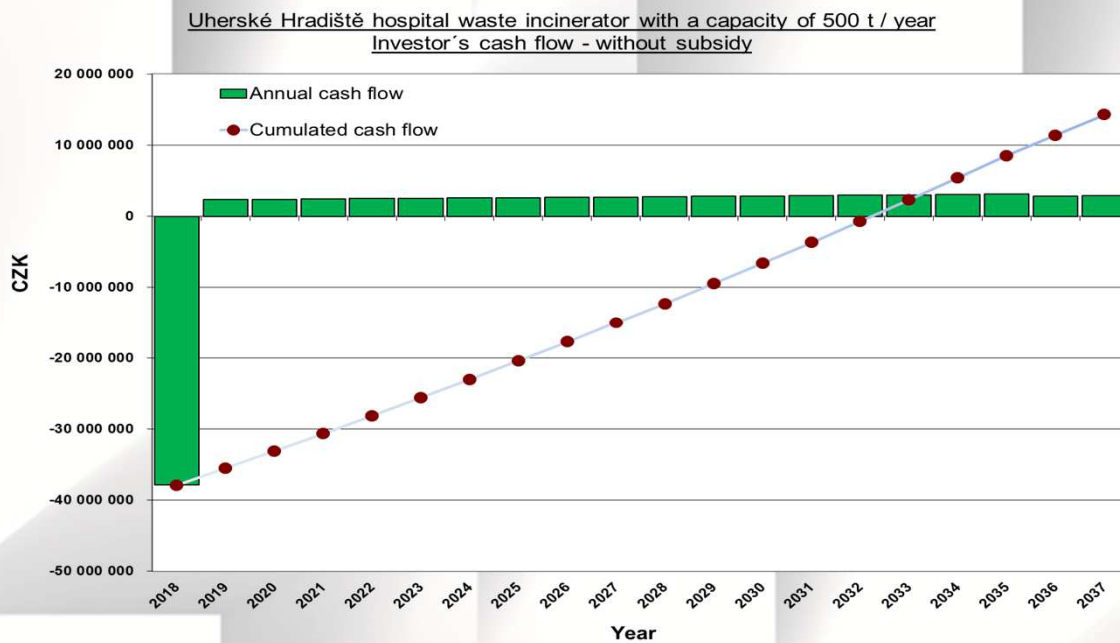
Uherské Hradiště hospital waste incinerator with a capacity of 500 t / year
Investor's cash flow - with 30% subsidy



FINANCING

**Scenario A - Annual processing capacity of waste incinerator is 500 t/year
 (without subsidy)**

Financial indicators	
Net present value - NPV	961 811,79 CZK
Internal rate ratio - IRR	3,27%
Payback period - simple	15 years
Payback period - discount	19 years
Evaluation year	2018
Lifetime period	20 years
Discount	3,00 %





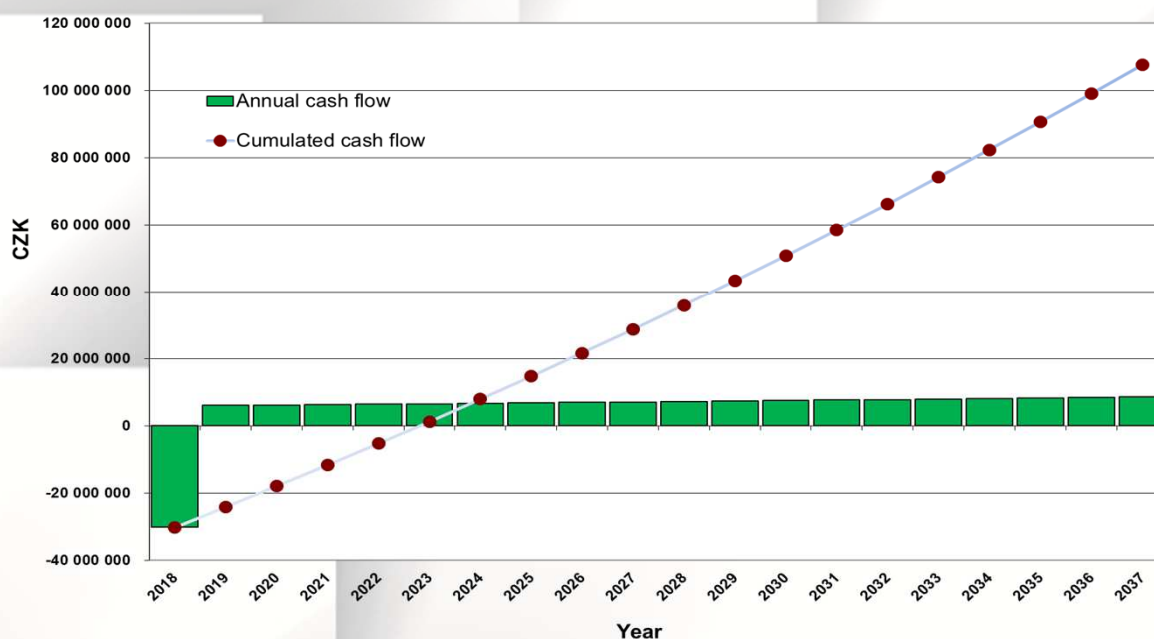
FINANCING

Scenario B - Annual processing capacity of waste incinerator is 1.000 t/year (30% subsidy)

Investment costs	44.500.000 CZK (1.780.000 EUR)
- Own sources – 70%	31.150.000 CZK (1.246.000 EUR)
- Subsidies (OP Environment) – 30%	13.350.000 CZK (534.000 EUR)
- Loans	0,- CZK
Lifetime (service life)	20 years
Annual operational costs (salaries, repairs, maintenance etc.)	3.400.000 CZK (136.000 EUR)
Annual revenues	11.400.000 CZK (172.000 EUR)
- Thermal energy	4.400.000 CZK (176.000 EUR)
- Waste	7.000.000 CZK (280.000 EUR)

Financial indicators		
Net present value - NPV	71 968 603,40	CZK
Internal rate ratio - IRR	21,27%	
Payback period - simple	5 years	
Payback period - discount	6 years	
Evaluation year	2018	
Lifetime period	20 years	
Discount	3,00 %	

Uherské Hradiště hospital waste incinerator with a capacity of 1000 t / year
Investor's cash flow - with 30% subsidy

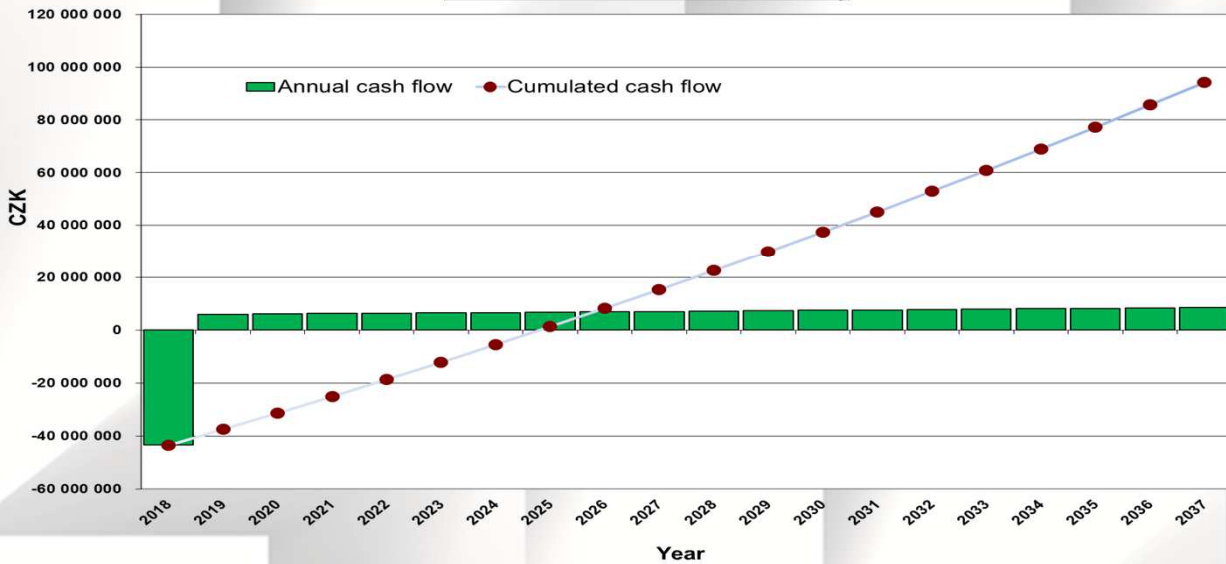


FINANCING

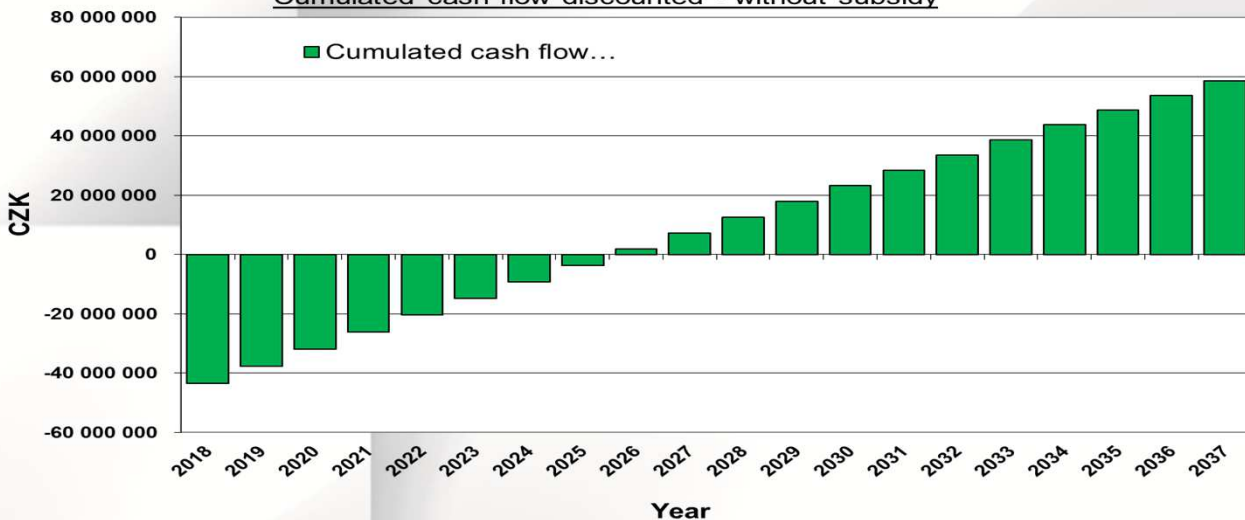
**Scenario B - Annual processing capacity of waste incinerator is 1000 t/year
 (without subsidy)**

Financial indicators		
Net present value - NPV	58 618 603,40	CZK
Internal rate ratio - IRR	14,27%	
Payback period - simple	7 years	
Payback period - discount	8 years	
Evaluation year	2018	
Lifetime period	20 years	
Discount	3,00 %	

Uherské Hradiště hospital waste incinerator with a capacity of 1000 t / year
 Investor's cash flow - without subsidy



Uherské Hradiště hospital waste incinerator with a capacity of 1000 t / year
 Cumulated cash flow discounted - without subsidy





TECHNICAL PARAMETERS

Parameter	Value
Annual processing capacity of waste scenario A / scenario B	500 / 1000 tons/year
Fund of working time	5400 hours/year
Thermic capacity var. A / var. B, during calorific value of waste 10 MJ/kg and during natural gas consumption 6 mN3/h, or 10 mN3/h	0,87 / 1,64 GJ/hour
Max. concentration of pollutants in output exhaust	According by Czech Directive no. 415/2012 Sb.

BARRIERS ENCOUNTERED

- Resistance of NGO sector to the waste combustion
- Lack of understanding from the general public related to usefulness of this project and negative ecological aspects of waste disposals to landfills

Ways to deal with barriers

- Feasibility study
- Report on the project effects on the environment
- Educational campaign

PARTNERS INVOLVED

- Uherské Hradiště hospital
- Zlín Region
- Energy Agency of the Zlín Region

Success factors

- Understanding and support from regional policy makers
- General consent from the side of public
- Financial support from OP Environment

CONTACTS:



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