FIRECE Final event, 16th September 2020

Tool to assess public investments to support industry low carbon transition

Pavel Ruzicka, ENVIROS, Czech Republic

TOOL TO ASSESS PUBLIC INVESTMENTS

- IT instrument – MS Excel based calculator

Two levels / two tools

Programme level tool

- Tool can be used for ex-ante assessment of a planned financial programme
- It calculates potential energy and environmental benefits as well as financial indicators

Project level tool

- Tool can be used for evaluation of energy and environmental benefits of particular projects
- It allows to compare different financing options and provides calculation of economic results

PROGRAMME LEVEL TOOL

Inputs	Outputs
• Expected budget (allocation) of the programme • Types of saving measures • Allocation per type of measure • Sectors addressed • Type and rate of co-financing	• Expected use of allocation • Expected investment cost • Expected energy savings • Expected decrease of emissions

Inside variables	

	• Types of saving measures
	  - Investment per GJ saved
	  - Measure lifetime
	  - Saving potential (on GJ) – per sector
	• Energy mix / emission factors

TYPES OF MEASURES

1. Installation of solar-thermal systems (for heat production)
2. Installation of photovoltaic systems (for electricity production)
3. Installation of frequency inventors
4. Installation of flue gas pre-heaters to boilers
5. Installation of cogeneration units
6. Installation/replacement of compressors
7. Installation of heat pumps in industry

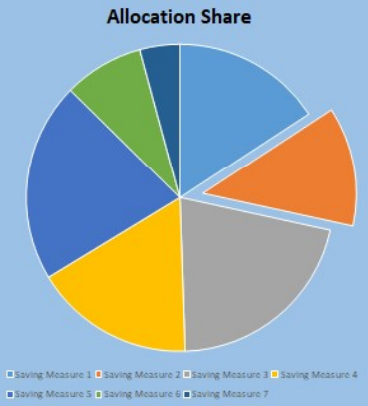
8. Change of technological processes
9. Energy management
10. Control of circulation pumps

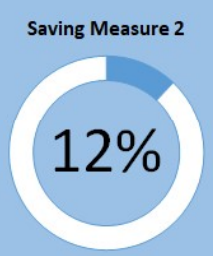
11. Replacement of coal boilers with gas boilers
12. Replacement of coal boiler with biomass boiler
13. Replacement of coal boiler with new coal boiler
14. Transformers replacement
15. Replacement of existing lighting with LED80
16. Replacement of lighting LED80 with LED110

17. Reduction of losses in heat distribution
18. Thermal insulation of technologies
19. Waste heat utilisation
20. Building insulation

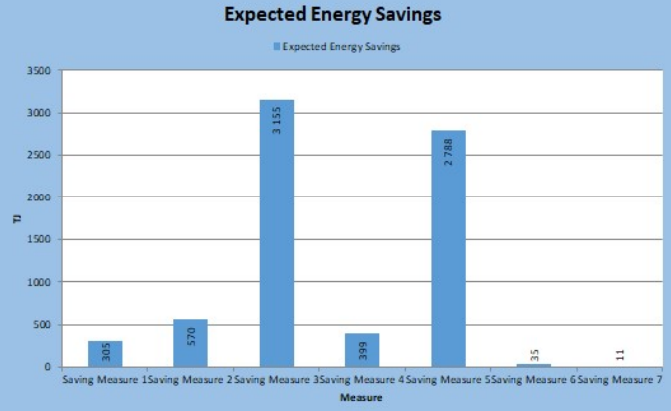
PROGRAMME LEVEL TOOL

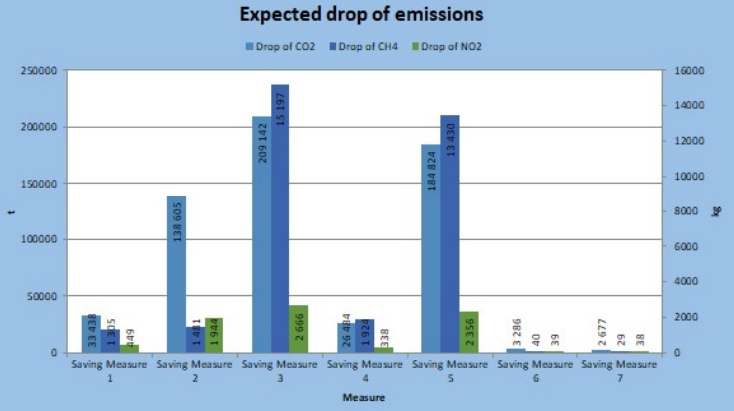
Title of the new policy (programme)			
Tolerance		10%	START NEW
Expected allocation of the policy (programme)	€	500 000,00	
Loan interest		1,00%	ADD MEASURE
Discount rate		5,00%	
Measure lifetime		20	RELOAD GRAPH
Saving Measure 2		ste heat utilisation	
Total saving potential of the measure		3 304 TJ	
Savings realised without any subsidies		1 817 TJ	
Share on the policy (programme allocation)		12%	
	€	60 000	
Share of subsidy on the total investment costs		50%	
Share of loan on the totatl investment costs		30%	
Share of own ressources on the total investment costs		20%	
Net Present Value		€ 35 886,26	
Expected allocation utilisation	€	33 158	Allocation will be likely not exhausted
Investment costs at the expected utilisation of the allocation	€	56 842	
Expected energy savings		570 TJ	
Expected drop of CO_2 emissions		138 605 t	
Expected drop of CH_4 emissions		1 481 kg	
Expected drop of N_2O emissions		1 944 kg	
Expected drop of CO_{2eq} emissions		139 221 t	
Expected Cash Flow		4 737 €/y	





Total program output		
Expected energy savings		7 262 TJ
Expected drop of CO_2 emissions		598 456 t
Expected drop of CH_4 emissions		33 406 kg
Expected drop of N_2O emissions		7 828 kg
Expected drop of CO_{2eq} emissions		601 624 t
Allocation	€	500 000,00
Expected allocation utilisation	€	465 021
Total investment costs	€	1 147 042
Price of the saved energy		157,95 €/GJ
Price of saved CO_2 emissions		1,92 €/t
Price of saved CH_4 emissions		34,34 €/kg
Price of saved N_2O emissions		146,52 €/kg
Price of saved CO_{2eq} emissions		1,91 €/t





	Saving Measure 2	Total program output	%
Expected allocation utilisation	€ 33 158	€ 465 021	7%
Total investment costs	€ 56 842	€ 1 147 042	5%
Expected energy savings	570 TJ	7 262 TJ	8%
Expected drop of CO2eq emissions	139 221 t	601 624 t	23%
Expected Cash Flow	4 737 €/y	136 404	3%

PROGRAMME LEVEL TOOL

Title of the new policy (programme)		
Tolerance	10%	
Expected allocation of the policy (programme)	€ 500 000,00	
Loan interest	1,00%	
Discount rate	5,00%	
Measure lifetime	20	
Saving Measure 2	Waste heat utilisation	
Total saving potential of the measure	3 304 TJ	
Savings realised without any subsidies	1 817 TJ	
Share on the policy (programme allocation)	12%	
	€ 60 000	
Share of subsidy on the total investment costs	50%	
Share of loan on the totatl investment costs	30%	
Share of own ressources on the total investment costs	20%	
Net Present Value	€ 35 886,26	
Expected allocation utilisation	€ 33 158	Allocation will be likely not exhausted
Investment costs at the expected utilisation of the allocation	€ 56 842	
Expected energy savings	570 TJ	
Expected drop of CO_2 emissions	138 605 t	
Expected drop of CH_4 emissions	1 481 kg	
Expected drop of N_2O emissions	1 944 kg	
Expected drop of CO_{2eq} emissions	139 221 t	
Expected Cash Flow	4 737 €/y	

START NEW

ADD MEASURE

RELOAD GRAPH

Programme-related inputs

Measure-related inputs

Measure-related outputs

PROJECT LEVEL TOOL

Inputs	Outputs
• Amount of investment • Lifetime of measure • Financial sources (grant, loan, own resources) • Interest rate • Period of repayment • Discount rate • Expected energy savings • Energy prices	• Expected decrease of emissions • Development of cash flow • NPV – Net present value • Payback period • Alternative ratio of a subsidy

Inside variables	• Energy mix / emission factors

PROJECT LEVEL TOOL

EN

Company name:	
Project name:	
Project ID:	7
Date:	

Description:
Set of measures:
- building envelop and roof insulation
- replacement of doors/windows
- modernization of technology (electric resistance furnace)

INPUT

Investment	Total	€	71 743,00
	Loan		48%
	Own Resource		0%
	Subsidy		52%
Loan	Interest rate		1,00%
	Repay		10 years
Own Resource	Discount rate		4,00%
Measure	Lifetime/expected payback period		25 years

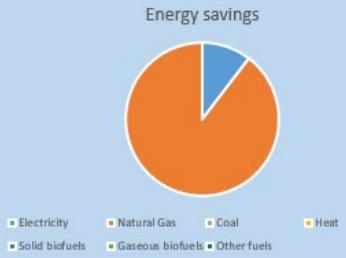
INPUT

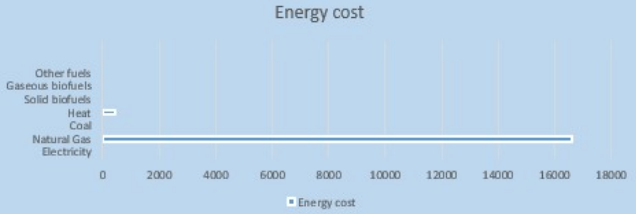
Expected energy savings & cost of energy

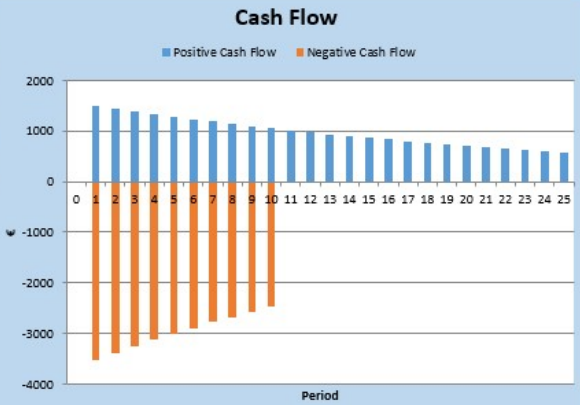
Electricity	2,80	MW/h	166,270 €/MW/h
Natural Gas	24,09	MW/h	45,100 €/MW/h
Coal	0,00	kW/h	0,000 €/kW/h
Heat	0,00	kW/h	0,000 €/kW/h
Solid biofuels	0,00	kW/h	0,000 €/kW/h
Gaseous biofuels	0,00	kW/h	0,000 €/kW/h
Other fuels	0,00	kW/h	0,000 €/kW/h
Total	26,89	MW/h	57,717 €/MW/h

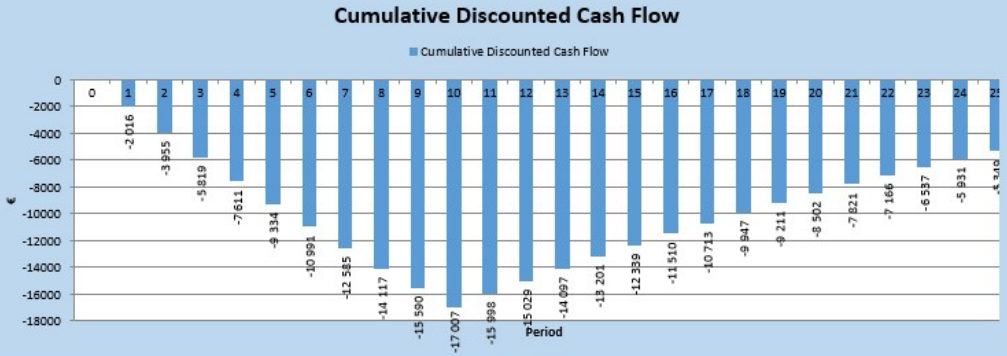
OUTPUT

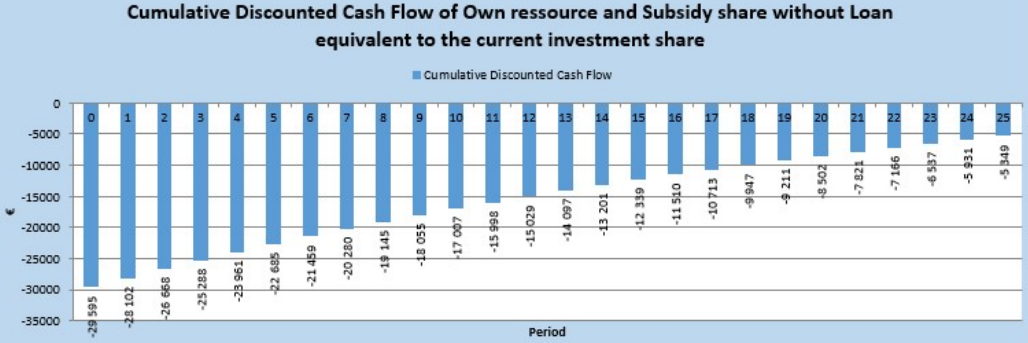
Expected drop of CO2 emissions		7 258,783 kg
Expected drop of CH4 emissions		112,926 g
Expected drop of N2O emissions		43,065 g
Expected drop of CO2eq emissions		7 274,440 kg
Expected Cash Flow		1 552 €/years
Net Present Value	€	(5 349,08)
Simple payback :		46 years
Equivalent scenario without loan investment		
Own ressources investment	€	29 594,79
Subsidy share:		59%











Thank you for your attention