Table S1. Parameters, methodology and results of calculation economic efficiency of using the SRF during clinker firing

№	Parameters	Limit value	Symbol	Sources
1	Daily kiln production quantity	3056 ton/day	KP	
2	Total operating day	360 day/year	TOD	Cement plant of Lithuania [69]
3	Emission factor of coal	85%	CA_{CO2}	
4	Energy required to produce one kg of clinker	840 kcal/kg	Ec	Hemidat at al. [22]
5	The calorific value of coal	7400 kcal/kg	HCV_{coal}	CMI [70]
6	Price 1 ton of coal	297 USD	P_{coal}	Directive 2000/76/EC [71]
7	The cost price of one-ton SRF	80 USD	P_{SRF}	Del Zotto et al. [72]
8	The calorific value of SRF	3821 kcal/kg	CV_{SRF}	Determined
9	Emission cost of one ton CO_2	85 USD	P_{CO2}	OECD [73]
10	Replacement ratio of SRF	10%, 15%, 20%	RR	
11	Coal consumption by initial situation	16 t/h	C^0_{coal}	

Methodology of calculation

The energy consumption of coal to produce clinker tons per day, kcal/kg (*E*):

$$En = KP \times 1000 \times Ec, \quad (1)$$

The coal energy consumption savings by using the replacement ratio of SRF, kcal/kg (*Esav*):

$$Esav = En \times RR \quad (2)$$

The SRF amount to be replaced per hour to achieve the required energy, ton/h (A_{SRF}):

$$A_{SRF} = \left(Esav / HCV_{SRF}\right) / 1000 / 24 \quad (3)$$

The coal amount per hour required to achieve the energy, ton/h (C_{coal}):

$$C_{coal} = \left(REn / CV_{coal}\right) / 1000 / 24 \quad (4)$$

where *RE* is the required energy to produce one kg of clinker taking into account the replacement ratio of SRF (kcal/kg):

$$REn = KP \times Ec_{calc} \times RR \times 1000 \quad (5)$$

where Ec_{calc} is calculation energy required to produce 1 kg of clinker (kcal/kg):

$$Ec_{calc} = \left(Ec \times AC\right) / 100 \quad (6)$$

where *AC* is the coal consumption (t/h) and was calculated by Eq. 7:

$$AC = C^0_{coal} - C_{coal} \quad (7)$$

where C_{coal} – coal consumption calculated by different replacement ratios of SRF (t/h).

The amount of SRF required for replacing one ton of coal (Q_{SRF}) was:

$$Q_{SRF} = A_{SRF} / AC \quad (8)$$

Using SRF as a replacement fuel, the annual coal savings, t/year (AS_{coal}), were calculated using Eq. 9:

$$AS_{coal} = AC \times TOD \times 24 \quad (9)$$

The annual income in coal savings, USD/year (*AI*), was calculated by Eq. 10:

$$AI = AS_{coal} \times P_{coal} \quad (10)$$

The annual consumption of SRF, t/year (AC_{SRF}),was calculated using Eq. 11:

$$AC_{SRF} = A_{SRF} \times TOD \times 24 \quad (11)$$

By Eq. 12, the annual costs of SRF, USD/year (C_{SRF}), were calculated:

$$C_{SRF} = AC_{SRF} \times P_{SRF} \quad (12)$$

The actual financial savings, USD/year (*FS*), were calculated using Eq. 13:

$$FS = AI - C_{SRF} \quad (13)$$

The annual CO_2 emission savings for the cement plant using coal, USD/year (CS_{CO2}), was calculated by Eq. 14:

$$CS_{CO2} = AC \times CA_{CO2} \times TOD \times 24 \quad (14)$$

Reducing CO_2 emissions from coal, USD/year (ES_{CO_2}), was calculated using Eq. 15:

$$ES_{CO_2} = CS_{CO_2} \times P_{CO_2} \quad (15)$$

Loss of efficiency taking into account the use of SRF, % (*LEf*), was calculated by Eq. 16:

$$LEf = 0.20 \times RR \times 100 \quad (16)$$

The net cost savings was calculated according to Eq. 17:

$$NCS = \frac{(AI + ES_{CO2} - C_{SRF}) \times (100 - LEf)}{100} \quad (17)$$

Calculation results				
Parameter	**Current situation**	**Scenario 1**	**Scenario 2**	**Scenario 3**
SRF replacement ratio (%)		10	15	20
Coal consumption ratio (%)	100	90	85	80
Coal consumption, (t/h)	16	11.7	10.4	9.25
SRF consumption, (t/h)		2.51	3.56	4.47
Replacement ratio to substitute 1 t of coal		1:0.58	1:0.64	1:0.66
Coal savings, (t/year)		37,084	48,012	58,314
Coal savings, (USD/year)		11,014,170	14,259,567	17,319,514
CO_2 emission saving in coal, (t/year)		31,522	40,810	49,567
CO_2 emission saving in coal, (USD/year)		2,679,373	3,468,867	4,213,248
Net saving, (USD/year)		11,713,131	14,803,652	17,699,517