

MED ATLANTIC ECOBONUS



Co-financed by the Connecting Europe
Facility of the European Union

SHIPOWNERS PERSPECTIVE TOOL

Version 2 / user manual

October 2018

About MAE Ship owner perspective tool

- This tool is conceived to estimate the contribution of the eco-incentive scheme to the shipowners' willingness regarding the adoption of green actions. The exercise is therefore aimed at assessing to what extent the indirect benefit to the shipowner due to the eco-incentive is contributing to stimulate the green action.
- Whereas the eco-incentive is directed through the users of the maritime service, the shipowner has to assess the contribution to his financial perspective on the green action by means of the additional incomes due to the effect on modal shift induced by the eco-incentive.
- The tool is designed and calibrated to estimate the line main incremental cash flows incurred as a result of the additional CAPEX and OPEX related to the green scenario (LNG, as described in the MAE example) and the additional incomes induced by the eco-incentive (as estimated through the calibrated transport model tool). This additional incomes are calculated as the marginal net contribution to the vessel induced by the additional units.
- The CAPEX is calculated as the incremental investment on an LNG fueled vessel compared to a conventional vessel (without any abatement system). Recent DNV-GL reference has been used for this calculation.
- Ultimately, the tool uses typical financial parameters to carry out the assessment and brings therefore the possibility to simulate different financial scenarios (which could be useful in the event of using financial instruments).
- The operational profile (vessel size, speed, frequency, etc.) of the lines is taken from the external cost calculator tool, although the user can override this values.
- As a result, the tool estimates the financial impact of an LNG investment WITH and WITHOUT eco-incentive



Input variables 1/2

Line details

Nautical miles	Distance from port of origin to port of destination expressed in nautical miles
Vessel Lane Meters	Freight capacity of the vessel expressed in lane meters
Trucks equivalent	Virtual trucks including pax (cars) and new vehicles (6 veh = 1 truck; 10 pax = 1 truck) considering a 70% occupation of the vessel freight capacity and measured at an average of 1 truck per 15 meters
Trucks	Real trucks, using the same assumptions for the occupation of the vessel and the average value of 1 truck per 15 meters
Vessel average speed	Average operational speed of the vessel in the service
Vessel power (kW)	Total main engine (propulsion) power
Weekly port salings	Number of departures from each port
Number of vessels	Number of vessels servicing the line
Departures (sailings)	Total annual departures (from both ends, for all participating vessels)
Tons of MDO (per sailing)	Total tons of conventional fuel used in each sailing
Tons of LNG (per sailing)	Total tons of LNG used in each sailing
Fuel saving per trip	Fuel saving per trip when using LNG with respect MGO expressed in euros

Indirect benefits

Induced modal shift	Additional units induced by the eco-incentive. This value can be obtained from the calibrated transport model tool. Expressed in units per year, in a 5 year period.
Unit net contribution	Marginal net contribution to the vessel from each additional unit (sea rate minus direct cost -fees, stevedoring, ...-)
Indirect benefit	Total annual contribution of the induced modal shift expressed in € per year during the 5 years period



Input variables 2/3

Investment cost

Incremental LNG inv.	Estimation of the additional investment of an LNG vessel (engine, gas treatment, storage) expressed in euros
Cost of LNG Kw	Incremental LNG investment expressed in euros per Kw of installed vessel power.

The previous input value are calculated to each individual line.

Common input values

WACC	Weighted average cost of capital
Res value	The value of the incremental investment at the end of its lifetime (20 years)
MGO ⁽¹⁾	Cost of the MGO or alternative ULSFO in €/ton
LNG ⁽¹⁾	Cost of LNG (€/ton). It is estimated as: (Price of the Molecule €/MWh + Logistics costs €/MWh) * 15,747 MWh/t

The previous input values are the same for all lines.

(1) For easy access to latest fuel prices please check and update the worksheet "FUEL PRICE"



Output variables

Indirect benefit/investment	Ratio returning the indirect benefit induced by the eco-incentive over the additional LNG investment cost
Indirect benefit/operation	Ratio returning the indirect benefit over the annual line operating cost
NPV	Net present value after discounting cash flows, namely: incremental investment, fuel saving, indirect benefits and residual value.
IRR	Internal rate of return
Payback	Number of years to break even the initial incremental investment



CHARTS: Enter inputs

1. Choose the common parameters for all lines.

WACC	8%	HFO	378 €	€/MWh	
Res. value	5%	MDO	550 €	molecule	22 €
		LNG	425 €	logistics	5 €

2. Verify or alter the line operational profile

BCN-LIV Barcelona Livorno	
Mediterranean Sea	
Line details	
Nautical miles	382
Vessel Lane Meters	3.810
Trucks equivalent	178
Trucks	178
Vessel average speed	17 knots
Vessel power (kW)	21.600
Weekly port salings	3 s/w
Number of vessels	2
Departures (sailings)	312
Tons of MDO (per sailing)	39
Tons of LNG (per sailing)	33
Fuel saving per trip	7.282 €

3. Enter the induced modal shift of the action in units, and the unit net contribution

BCN-LIV Barcelona Livorno	
Induced modal shift	30 K units
Y1	6,850
Y2	7,103
Y3	7,366
Y4	7,638
Y5	7,921
Unit net contribution	540 €
Indirect incentives	19.914.138 €
Y1	3.698.781,646
Y2	3.835.645,885
Y3	3.977.574,445
Y4	4.124.754,720
Y5	4.277.381,036

4. Enter the incremental LNG investment

BCN-LIV Barcelona Livorno	
Incremental LNG inv.	24.000.000 €
cost of LNG Kw	556 €



CHARTS: Check results

BCN-LIV Barcelona Livorno	
Incremental LNG inv.	24.000.000 €
cost of LNG Kw	556 €
Annual fuel saving	2.272.056 €
Indirect incentive/investment	83%
Indirect incentive/operating	15%
WITH NPV	14.810.830 €
IRR	19%
Payback	5 years
WITHOUT NPV	-1.161.463 €
IRR	7%
Payback	NEVER

Financial viability of the investment, WITH the eco-incentives

Financial viability of the investment, WITHOUT eco-incentives



CHARTS (features)

Using the + buttons you can show/hide individual facades or show/hide individual lines of the results

Line details

Nautical miles

Vessel Lane Meters

Trucks equivalent

Trucks

Vessel average speed

Vessel power (kW)

Weekly port salings

Number of vessels

Departures (sailings)

Tons of MDO (per sailing)

Tons of LNG (per sailing)

Fuel saving per trip

Induced modal shift

Y1

Y2

Y3

Y4

Y5

Unit net contribution

Indirect incentives

Y1

Y2

Y3

Y4

Y5

Incremental LNG inv.

cost of LNG Kw

Annual fuel saving

Indirect incentive/investment

Indirect incentive/operation

WITH NPV

IRR

Payback

WITHOUT NPV

IRR

Payback

BIO-ZBR	SAN-PMT	GIJ-NAN	VGO-NAN	LEX-ZBR	LIS-ZBR
Bilbao-Zeebrugge	Santander Portsmouth	Gijon-Nantes	Vigo-Nantes	Leixoes Zeebrugge	Lisbon Zeebrugge
Atlantic	Atlantic	Atlantic	Atlantic	Atlantic	Atlantic
675	537	271	475	844	1020
3.050	3.050	2.100	1.500	3.500	3.500
142	162	116	112	163	163
142	142	98	70	163	163
17 knots	17 knots	18 knots	17 knots	14 knots	14 knots
24.000	40.000	21.600	18.000	25.000	25.000
3 s/w	2 s/w	3 s/w	5 s/w	3 s/w	1 s/w
2	1	1	2	3	1
312	156	312	468	312	104
68	54	31	48	72	86
58	46	26	41	61	74
12.630 €	10.111 €	5.752 €	8.980 €	13.364 €	16.105 €
28 K units	43 K units	29 K units	31 K units	58 K units	32 K units
6,188	10,584	6,344	7,018	12,984	7,236
6,491	10,651	6,656	7,349	13,580	7,564
6,806	10,711	6,978	7,695	14,200	7,905
7,121	10,737	7,305	8,028	14,822	8,255
7,437	10,759	7,644	8,386	15,467	8,619
400 €	580 €	540 €	560 €	580 €	581 €
13.617.116 €	30.996.659 €	18.860.442 €	21.546.473 €	41.210.098 €	22.987.932 €
2.475.018	6.139.002	3.426.010	3.929.894	7.530.700	4.202.753
2.596.377	6.177.320	3.594.063	4.115.611	7.876.344	4.393.063
2.722.306	6.212.501	3.768.200	4.309.125	8.235.828	4.591.207
2.848.430	6.227.491	3.944.575	4.495.862	8.596.483	4.794.719
2.974.986	6.240.344	4.127.595	4.695.980	8.970.743	5.006.190
24.000.000 €	20.000.000 €	13.000.000 €	20.000.000 €	36.000.000 €	12.000.000 €
500 €	500 €	602 €	556 €	480 €	480 €
3.940.508 €	1.577.342 €	1.794.523 €	4.202.450 €	4.169.492 €	1.674.924 €
57%	155%	145%	108%	114%	192%
17%	54%	26%	26%	31%	52%
26.506.802 €	20.735.049 €	20.057.941 €	39.382.351 €	38.809.999 €	23.130.398 €
23%	31%	36%	38%	27%	45%
5 years	4 years	3 years	3 years	4 years	3 years
15.619.576 €	-4.041.178 €	5.122.035 €	22.364.187 €	6.027.733 €	4.958.072 €
16%	5%	13%	21%	10%	13%
9 years	NEVER	12 years	7 years	15 years	12 years



Using the tool



For further information about MED Atlantic Ecobonus
and Ship owners perspective tool
please contact: mae.project@puertos.es



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