Sustainable Sea Transport Talanoa

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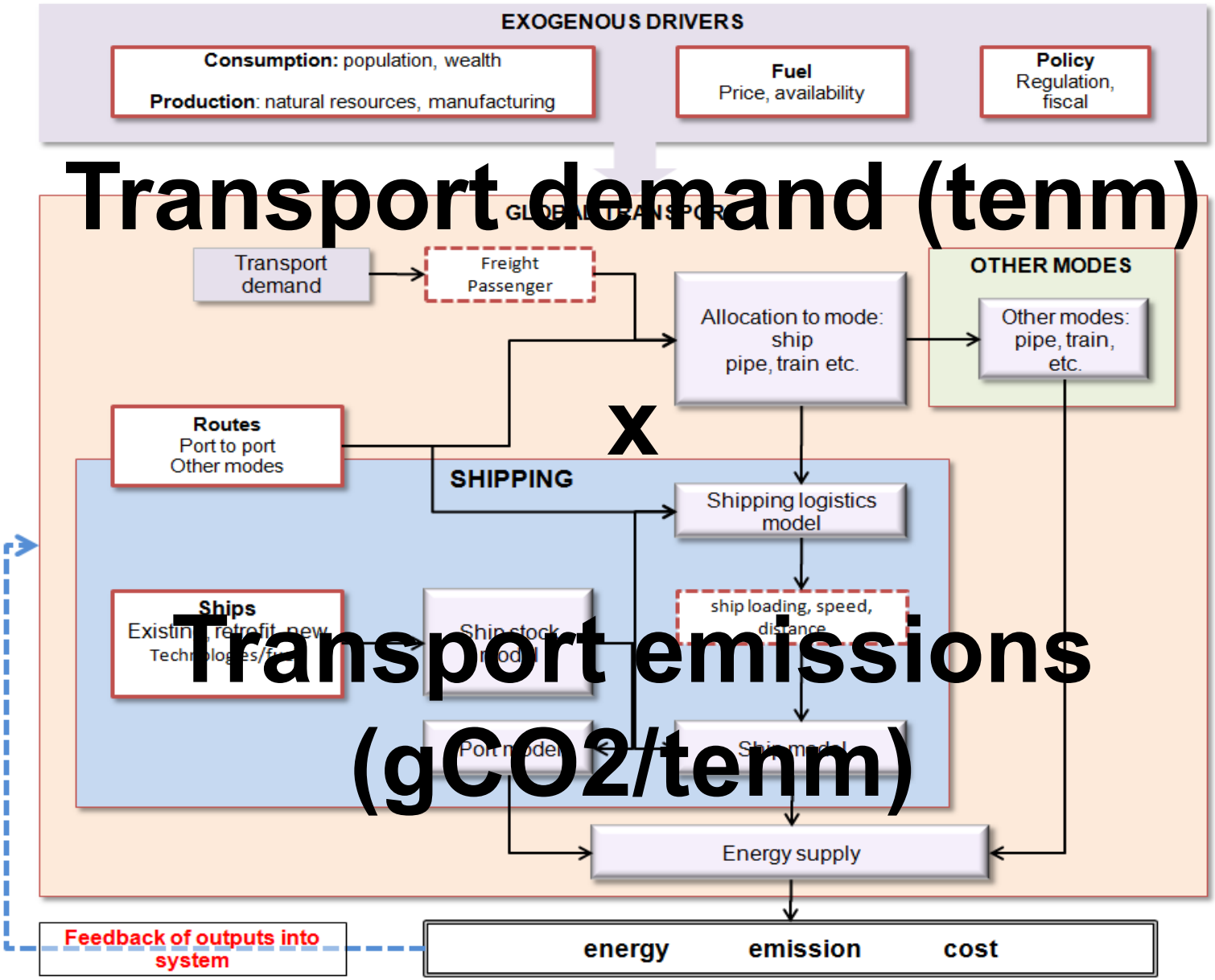
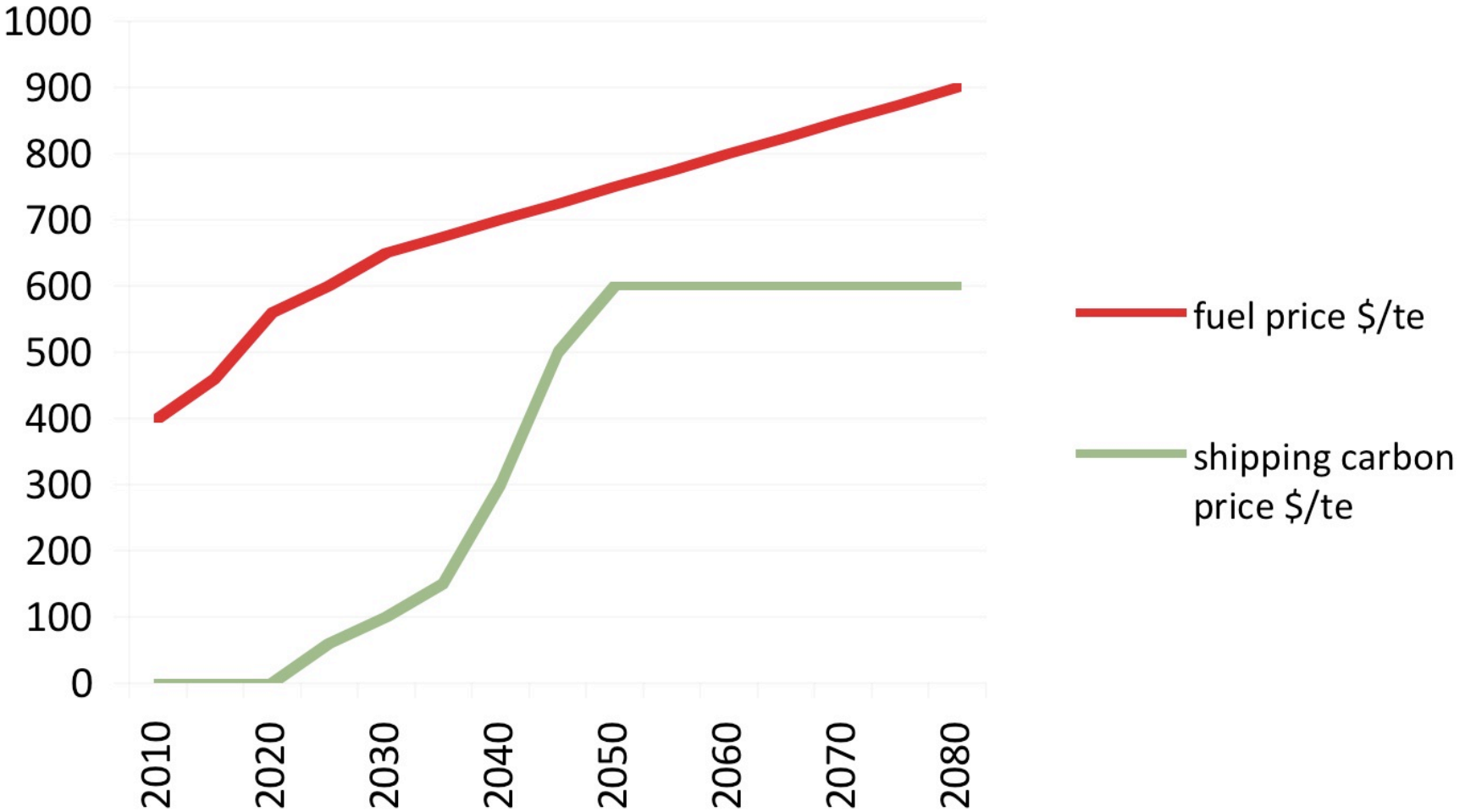
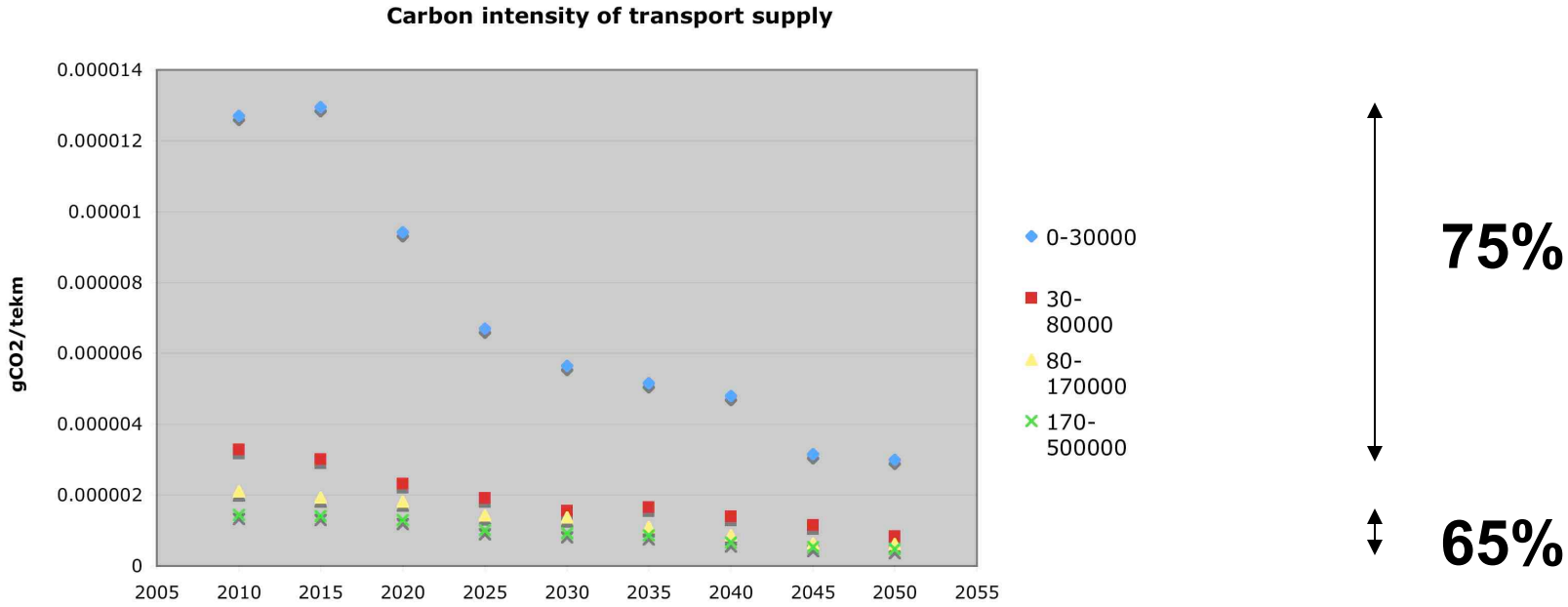
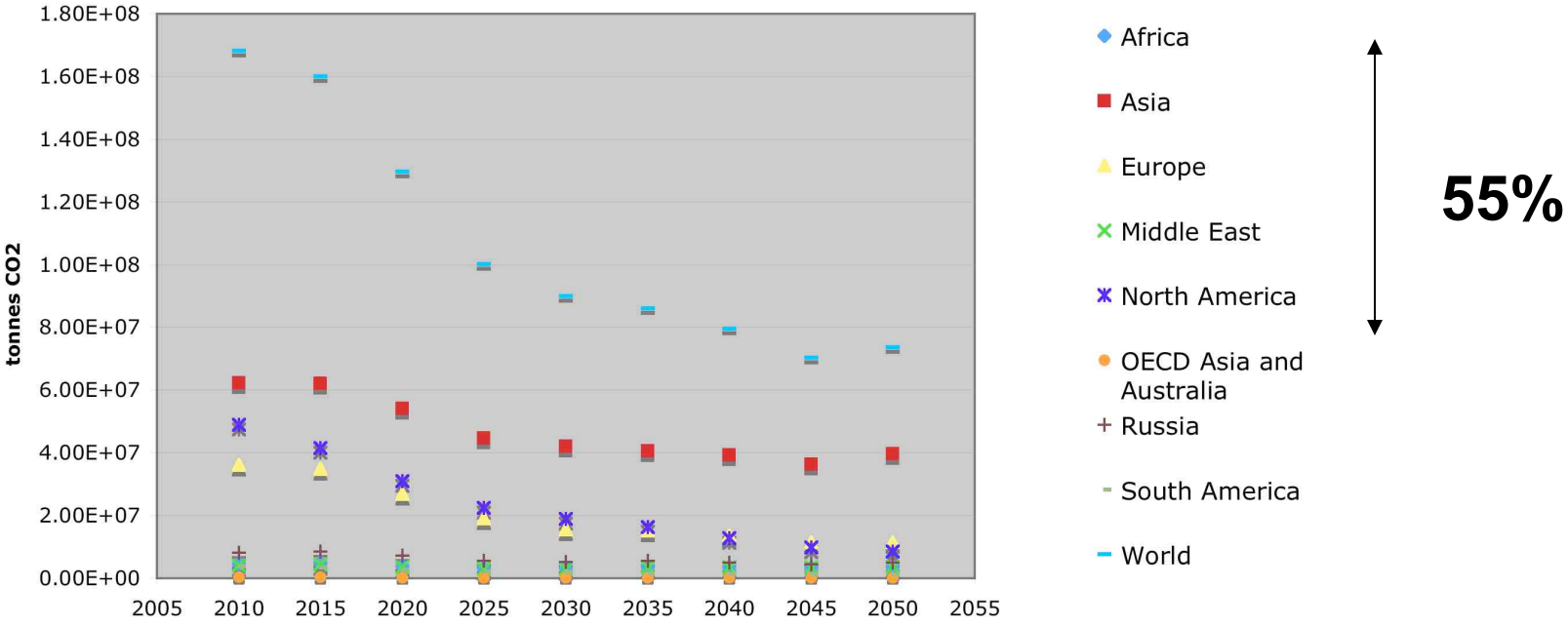
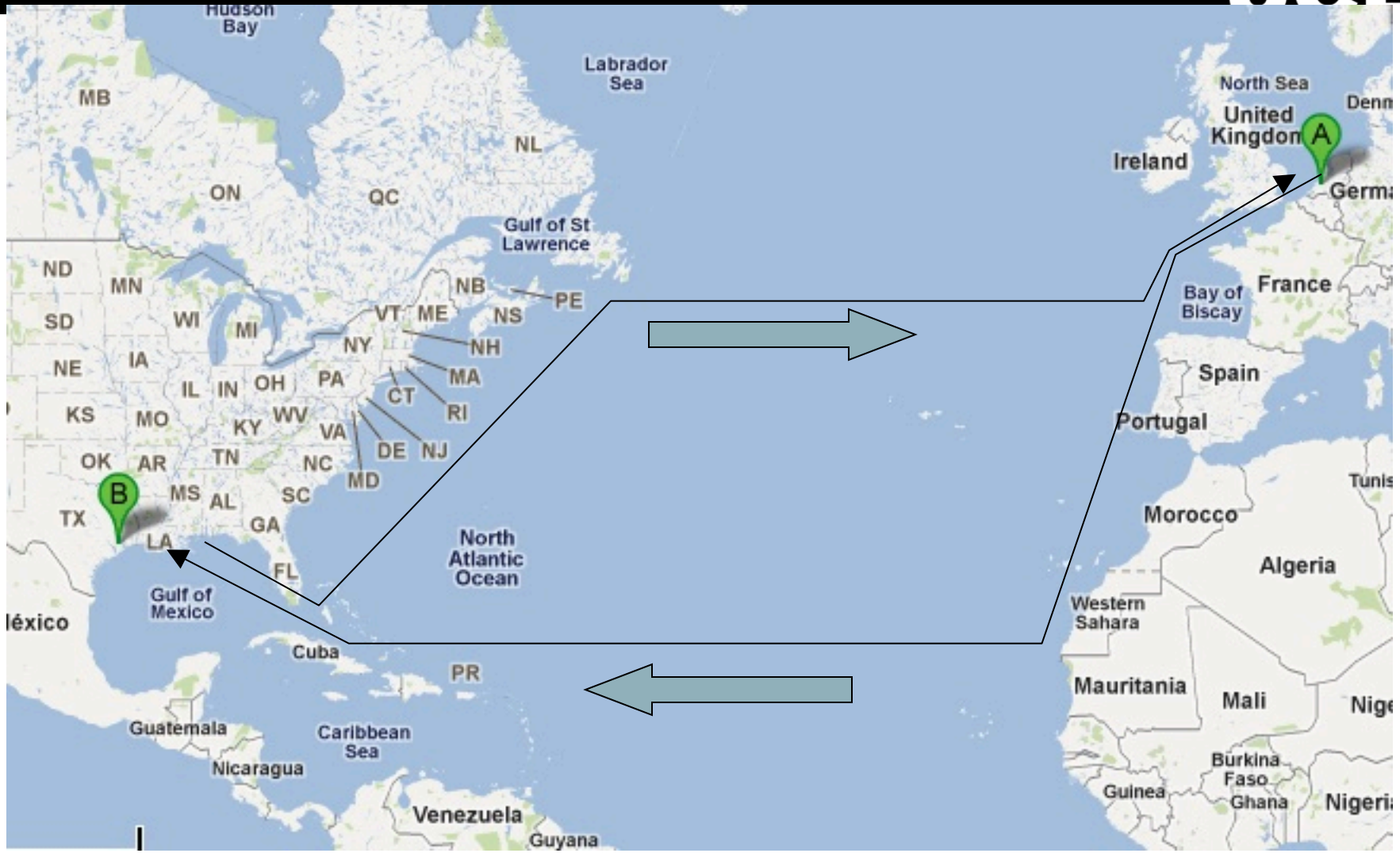

EXOGENOUS DRIVERS
Consumption: population, wealth
Production: natural resources, manufacturing
Fuel
Price, availability
Policy
Regulation, fiscal
Transport demand (tenm)
GLOBAL TRANSPORT
Transport demand
Freight
Passenger
OTHER MODES
Allocation to mode: ship pipe, train etc.
Other modes: pipe, train, etc.
Routes
Port to port
Other modes
x
SHIPPING
Shipping logistics model
Ships
Existing, retrofit, new
Technologies/fu
Ship stock model
ship loading, speed, distance
Transport emissions (gCO2/tenm)
Port model
Ship model
Energy supply
Feedback of outputs into system
energy
emission
cost



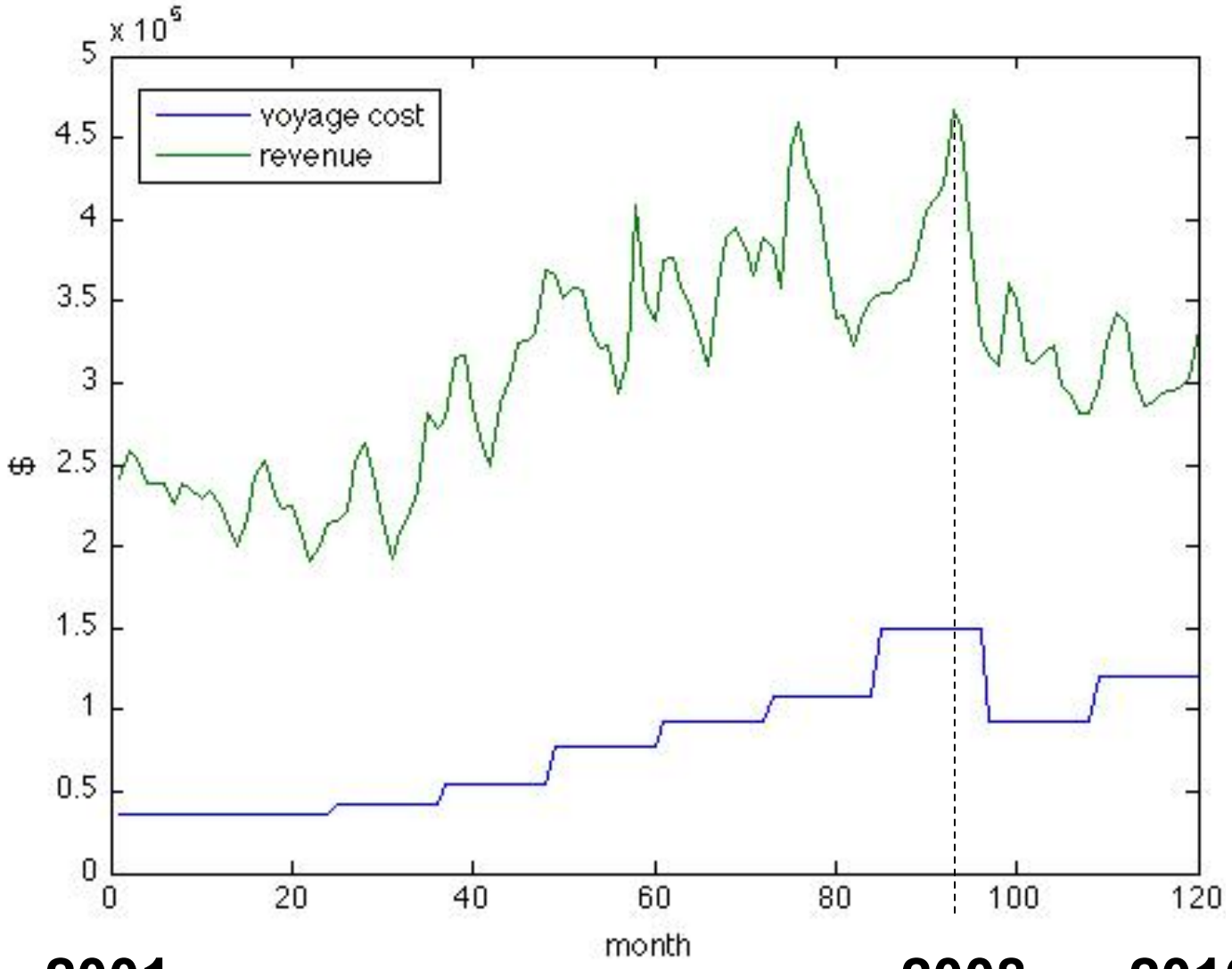
+ regulatory scenario (EEDI, MARPOL VI etc)


Carbon intensity of transport supply
gCO2/tekm
0.000014
0.000012
0.00001
0.000008
0.000006
0.000004
0.000002
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
0-30000
30-80000
80-170000
170-500000
75%
65%


Annual CO2 emissions
tonnes CO2
1.80E+08
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Africa
Asia
Europe
Middle East
North America
OECD Asia and Australia
Russia
South America
World
55%



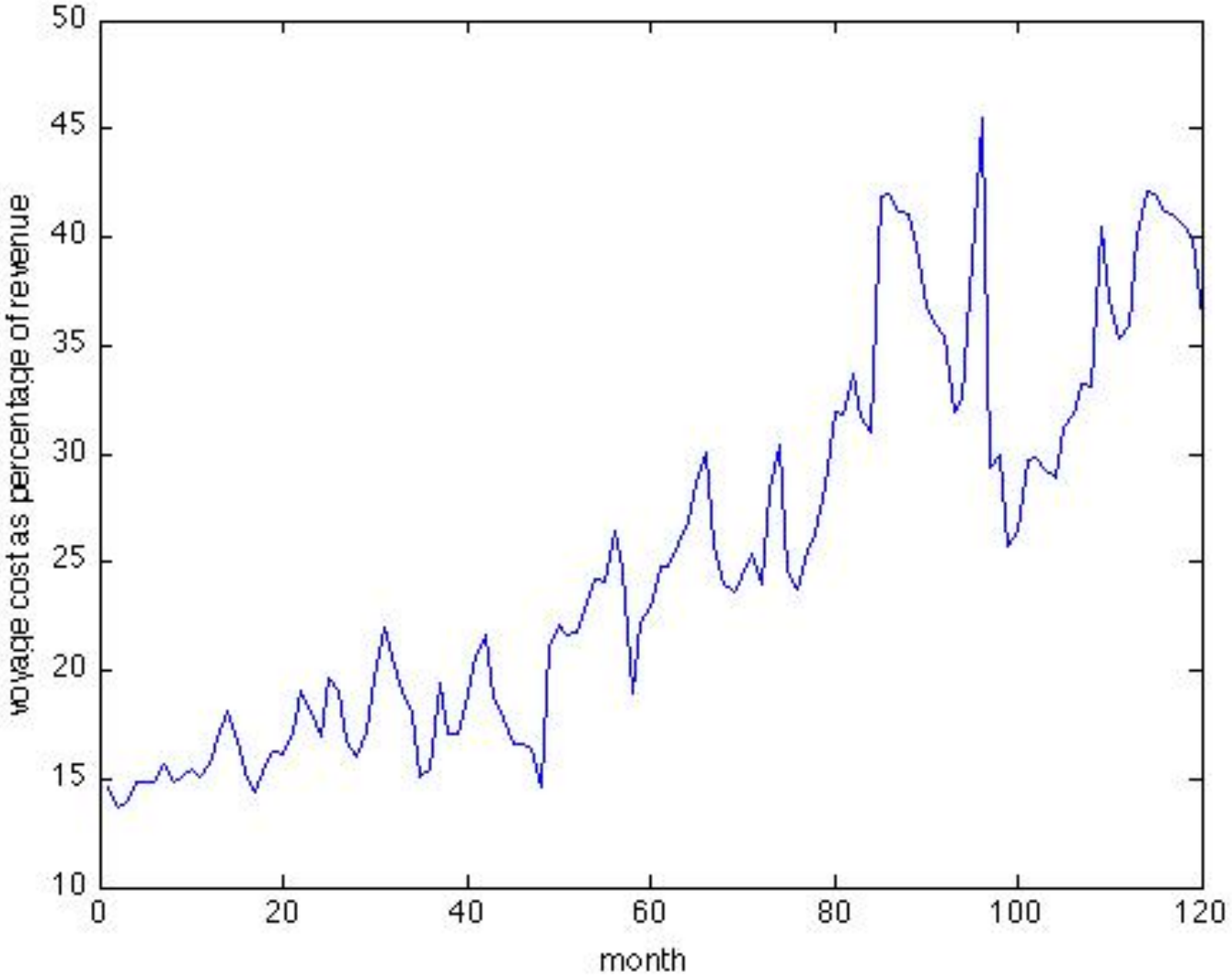
- Houston - Rotterdam ~6200nm



5000 te parcel, Hou-Rot + Rot-Hou, Clarksons SIN

HFO ~ $400 / te

2001 **2008** **2010**


wage cost as percentage of revenue
50
45
40
35
30
25
20
15
10
0
20
40
60
80
100
120
month

2001 **2010**

- Fuel price:
  - HFO = $700 / te
  - LNG = $400 /te
- Carbon price = $45 / te
- 60% wind, 40% LNG

		
Voyage costs $/pa	1,200,000	240,000
Fixed costs $/pa	~1,000,000	?
Carbon te/pa	4500	0

Concluding remarks

- The non-economic case is a no-brainer but unlikely to generate the flows of capital which can enable at scale
- The basic economic case for wind assistance is a straightforward trade-off of higher fixed costs and lower operating costs, but there is a challenge to calculate these rigorously and present with credibility
- We don't currently see lack of GHG regulation or carbon pricing as an obstruction to the take-up of wind assistance technology

Thank you and thanks to LCS members, particularly the management board:

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