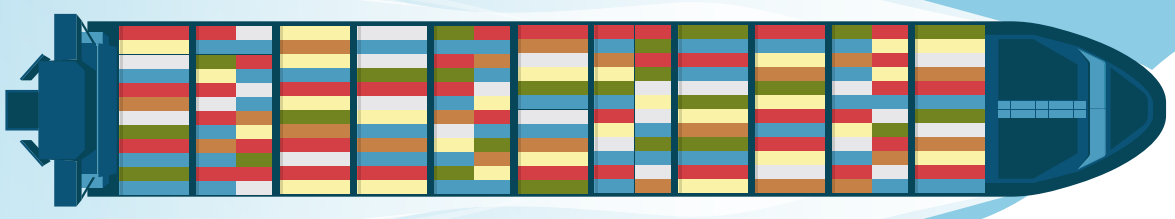
BIOFILMS & MARINE BIOFOULING

This is a Real Drag, and it Wastes Energy

National Biofilms Innovation Centre

#BIOFILMAWARE

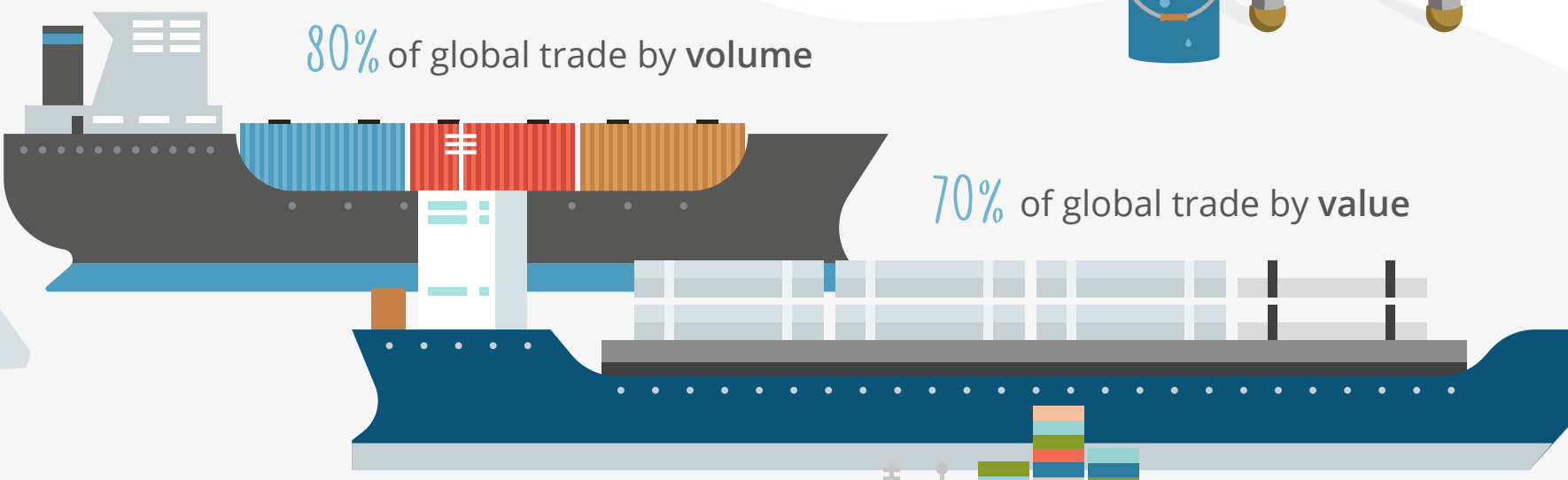
INCREASED FUEL COSTS RELATED TO DRAG CAUSED BY MARINE BIOFOULING **£10,000M**



TOTAL VALUE OF MARINE VESSEL ANTIFOULING **£28,700M**

50,000 REGISTERED MERCHANT SHIPS

are responsible for transporting:



80% of global trade by **volume**

70% of global trade by **value**

GLOBAL SHIPPING CAPACITY

is **growing** by **2.7% PER YEAR**

Shipping is reported to account for

2% OF ALL GLOBAL CARBON DIOXIDE EMISSIONS

with the largest emissions from the **container ship**, **bulk carrier** and **oil tanker** fleets

MARINE BIOFOULING

can **increase** drag by up to **34%**

BIOFILMS & MARINE BIOFOULING

Aquaculture

National Biofilms Innovation Centre

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BIOFOULING in AQUACULTURE has a **global cost** of

£4,000M – £8,000M

Aquaculture has seen **significant growth** in recent decades.

Inland production in 2018 was

51.3M TONNES

whilst **Marine** production was

30.8M TONNES

This is in contrast to **commercial fishing,** which has not significantly changed in the period 1986 TO 2018

with **annual production** typically between

80 & 90M TONNES

Marine biofilms are a huge issue for aquaculture and can form on:

SURFACES OF FISH

including the surface of shellfish

NATURAL SURFACES

exposed to organisms that live on waste food and fish waste from aquaculture

INFRASTRUCTURE

such as nets, floats, cages and ropes

The management of these biofilms accounts for

5–10% OF PRODUCTION COSTS