

Moffatt & Nichol Today

Still a Family-run Company 77 Years Later

80%
REPEAT BUSINESS

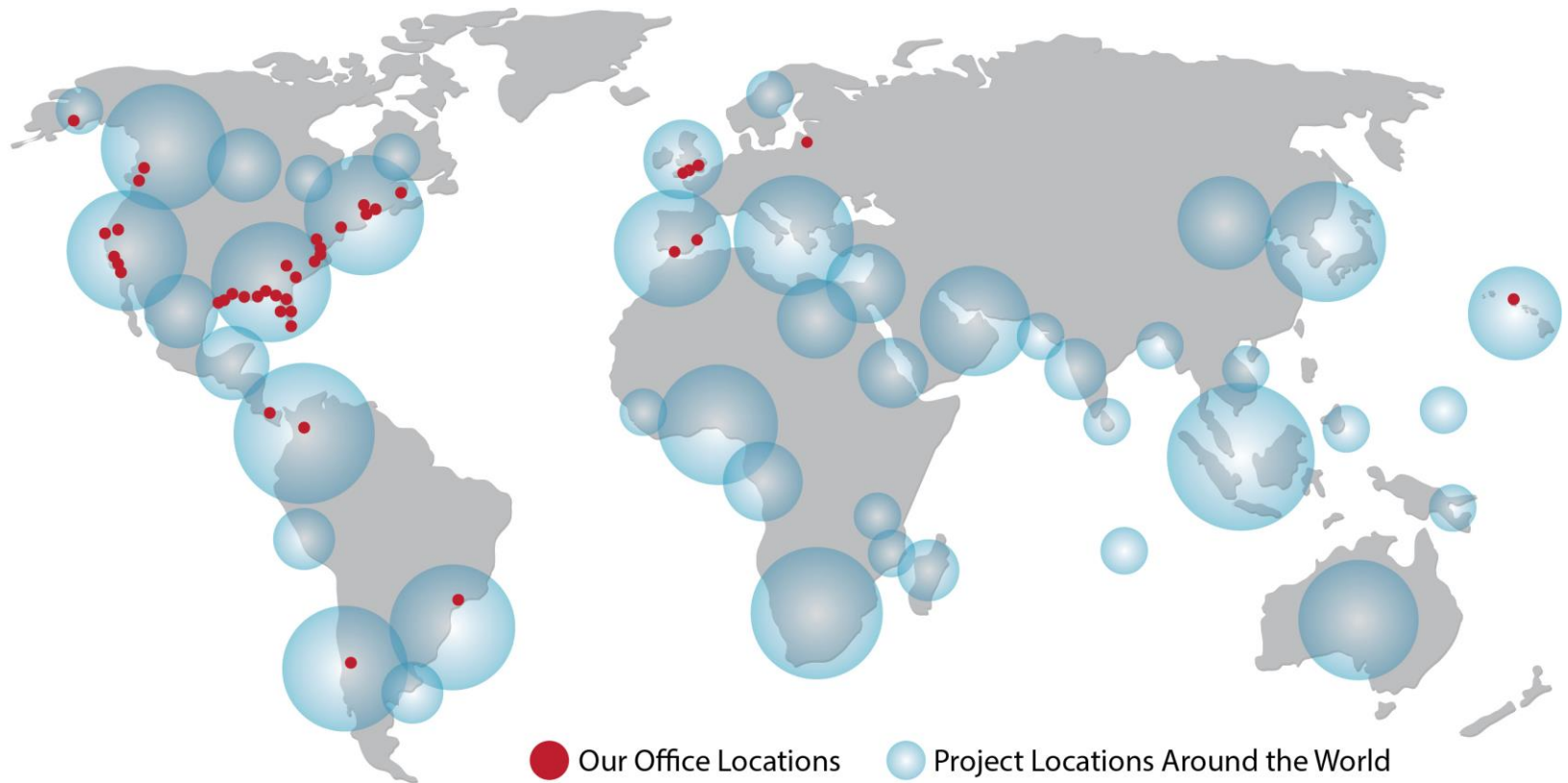
50 OFFICES
WORLDWIDE

OUR MOTTO:
TO BE THE BEST
NOT THE BIGGEST!

NO PROJECT
TOO SMALL

12,000+ PROJECTS
COMPLETED

1,000+ HIGHLY EXPERIENCED PORT
AND TRANSPORT PROFESSIONALS



What does AI know about it?

The linkages between economic growth, environmental sustainability, and resource efficiency are complex and interconnected. The three key linkages to consider are:

1. **Green Jobs and Economic Opportunities:** Environmental sustainability and resource efficiency initiatives can create new economic opportunities and jobs. Transitioning to renewable energy sources, improving energy efficiency in buildings, and implementing sustainable practices in industries like agriculture and manufacturing can stimulate economic growth while promoting environmental sustainability. These green jobs contribute to job creation, income generation, and overall economic development.
2. **Cost Savings and Resource Efficiency:** Resource efficiency measures, such as optimising energy use, reducing waste, and conserving water, can lead to significant cost savings for businesses and households. By adopting sustainable practices, organisations can improve their operational efficiency, reduce waste disposal expenses, and enhance productivity. These cost savings can then be reinvested in further economic growth and innovation.
3. **Risk Mitigation and Long-term Resilience:** Environmental sustainability and resource efficiency efforts contribute to mitigating risks and enhancing long-term economic resilience. For instance, addressing climate change through emission reduction measures and adaptation strategies can minimise the economic costs associated with extreme weather events, such as hurricanes, droughts, and floods. Similarly, conserving natural resources and biodiversity helps protect critical ecosystems that provide valuable services like clean water, pollination, and climate regulation, reducing vulnerabilities and ensuring economic stability.

These linkages demonstrate that pursuing environmental sustainability and resource efficiency is not contradictory to economic growth – they can be mutually reinforcing. By harnessing economic opportunities, realising cost savings, and enhancing resilience, we can foster a sustainable and prosperous future for both our economy and the environment.



ChatGPT

What are the 3 most important Linkages between Economic Growth, Environmental Sustainability and Resource Efficiency?

What do I know about it?

The linkages between economic growth, environmental sustainability, and resource efficiency are complex and interconnected. The three key linkages to consider are:

1. **Holistic?Polemic:** In recent decades we have reached a turning point in the relationship between generating economic growth (required because of ongoing population growth) and the use of natural resources / creation of emissions, especially GHGs. If we are not successful in finding ways to create sustainable and resource-efficient solutions alongside economic growth now, we are failing future generations.
2. **Economic:** Economic growth, usually measured by GDP, changes over time, and often does not include all the positive and negative externalities related to production. As a result, relative pricing does not reflect actual scarcity of natural resources, and this leads to distorted usage (non-sustainable over usage). If substantial social and environmental costs are not accounted for in economic growth figures, they cannot claim to be resource-efficient, and the result is usually “market failure” by non-internalisation of external costs (no pareto welfare maximum). On the other hand, if usage of natural resources is properly considered within the relative pricing system, resource-efficient sustainable economic growth can be achieved. With market failure there is the need for interventional measures (from market regulators) in order to rebalance the relative pricing mechanism towards more efficient resource use, e.g. by establishing a specific market / pricing system for CO₂ emissions (carbon certificate pricing and trading), or by setting mandatory emission cutting targets, such as EU fit-for-55. These types of regulatory interventions are the key drivers for industrial sectors to reach resource efficiency and sustainable economic output / growth.
3. **Maritime Ports-related:** The ability to improve standard of living over time depends almost entirely on the ability to increase capital productivity and increase energy efficiency. Innovation must be based on doing more with less and moving towards lower cost renewable energy systems. This is a challenge for all economic sectors of a country, but efficient, environmentally-sound / climate-neutral maritime transport is critical. Why? Maritime transport plays a key role in generating economic growth, and in most countries prosperity supports trade and nearly all important industrial supply chains, starting from the transport of raw material to the distribution of goods to final customers.
 - 1) Maritime ports as green logistic hubs.
 - 2) Maritime ports as important intersections for ongoing energy transition.



Joachim

What are the 3 most important Linkages between Economic Growth, Environmental Sustainability and Resource Efficiency?

Why is Addressing Sustainability Important?



**Sustainable Ports are Efficient
and Resilient, Creating the
Foundations of Economic
Prosperity!**

This is why fostering Environmental Sustainability
and Resource Efficiency in Ports is key for
Moffatt & Nichol.

GreenPort Go

- › The Moffatt & Nichol "**GreenPort Go-Team**" is a group of more than 15 experts from various disciplines across our company, compiling expertise and a unique service portfolio for addressing and fostering Environmental and Social Governance in ports.
- › Currently, the team focuses primarily on the aspects of **Emission Reduction / Environmental Impact / CO₂ Footprint** of ports and port terminals.
- › The team offers clients a **360-degree Service Portfolio** ranging from strategy building, planning of measure mix / related analysis, implementation and operation of all kinds of technical, operational and organisational changes that improve the social and environmental footprint of ports and port terminals.
- › The team aims to provide workable and efficient solutions for all types of public administrations (port authorities) and private stakeholders (terminal operators) to handle the changing legal framework in the maritime port sector in different global regions e.g. **EU-Taxonomy / Fit-for-55**.



GreenPort Go – Services

› Fostering ESG at All Stages of a Port Development Project Cycle

Client's Challenge

What to Do

How to Do it

How to Start

Day- to-Day Doing

M&N Solution

Strategy Building

- › Strategy Benchmark / Balanced Scorecard / SWOT / PESTEL
- › Emission Measurement / Target Setting, e.g. GHG Protocol adaption for ports
- › Strategic Options and Mix
- › Feasibility Level Analysis / Business Planning (incl. CAPEX / OPEX) / CBA
- › Specific Strategic Studies (Cost & Availabilityy-Analysis of energy sources)
- › Financing Strategy / Funding Screening

Planning

- › Dynamic Simulation of emissions
- › EIA / SIA
- › Specific engineering studies, e.g. costal protection, restorage planning, studies on dredging / material dumping
- › Climate Change IA
- › Measure Mix fine-tune and transition
- › System resilience analysis

Implementation

- › Project Management
- › Procurement / Support
- › Permission Support
- › Construction Supervision
- › TPI, Testing, Commissioning
- › BIM with green data layer
- › Supporting Certification, e.g. EMAS, ISO 14000
- › Supporting Funding and Financing

Managing / Operating

- › Dynamic Emission Monitoring / Dynamic Intervention / Conflict Alert
- › Support on ESG Corporate Accounting / Reporting / KPIs on Emission and Ressource Use (GHG Protocol Standard)

GreenPort Go – Strategy Building

› Strategic Options to reach CO₂-neutral terminal operations

Client's Challenge

What to Do

Defining Strategy for CO₂-Neutral Terminal Operations and Creating Tailored Solutions on how to Archive (Transition Path), e.g. Reduction of GHGs by 50% until 2030 against 2019

Defining the Option Mix and its Transition in Time

M&N Solution

-50% ↑

-20% ↑

-30% ↓

Technical Options

- › Equipment: Electrification / H₂-related Equipment / More Fuel-Efficient Equipment, e.g. Hybrid
- › Energy Supply: Own Green Energy Production / Green Electricity Supplier / H₂-/H₂-Carrier/E-Fuel Supplier, Geotherm solution, waste heat solutions
- › Refurbishment of Electric System and Consumers, especially Lighting (LED) and Cooling / Heating (Minimising Energy Consumption / Losses)
- › On-shore Power Supply
- › Use of CO₂-neutral materials in terminal construction/equipment
- › Implementing tools for Emission Measurement (inventory) and dynamic intervention
- › Future: Carbon Capture

Organisational

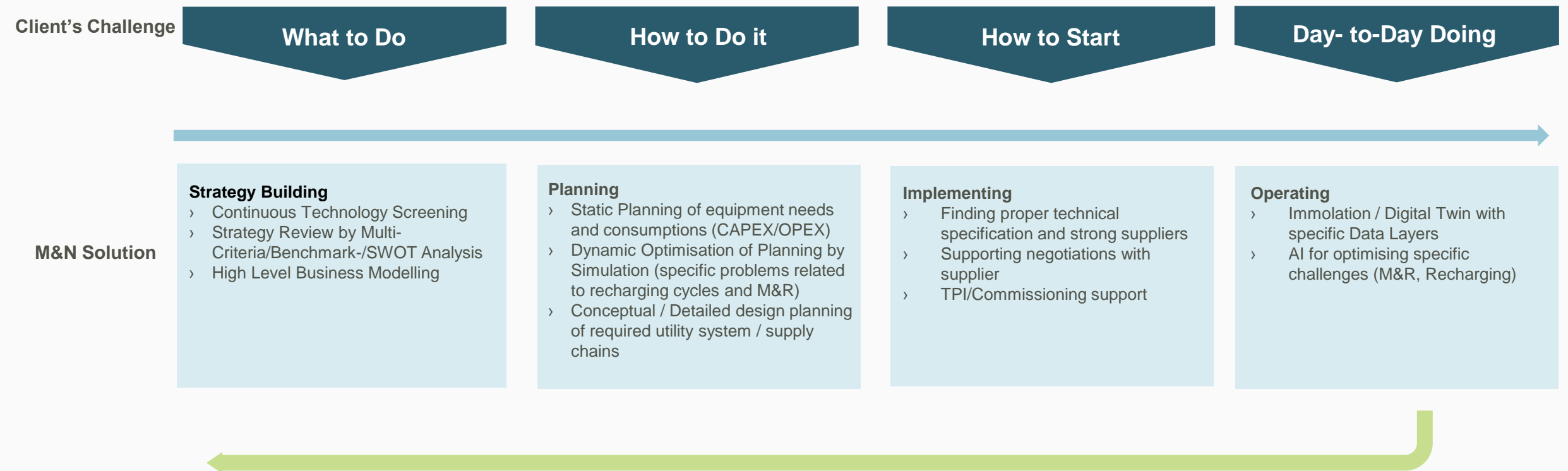
- › Procurement of CO₂-neutral materials for construction and equipment (Green Steel, Green Concrete, etc.) = applying ESG supply chain roles
- › Arranging the Supply of Green Energy from the Market
- › Process Modelling and Operative Guidelines / Rules on saving energy and resources (recycling)
- › Training of Management and staff on processes/guidelines
- › Surveillance, Monitoring and Reporting on ESG (Implementing of Environmental Standard)
- › Marketing on ESG

Compensation

- › Buying/Trading of Emission Certificates
- › Creating of own compensation projects and schemas (applicable in EU Taxonomy)
- › Buying in existing projects and schemas (direct investments in projects or find solution that is applicable in EU Taxonomy)

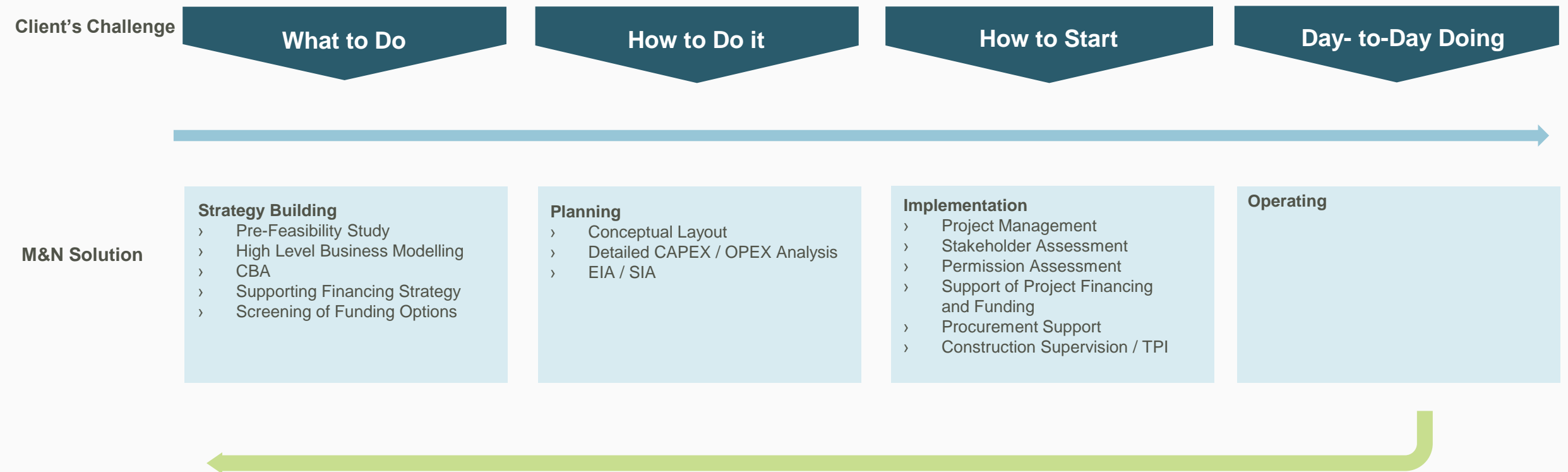
GreenPort Go – Equipment Electrification

› Using innovative CO₂-neutral equipment



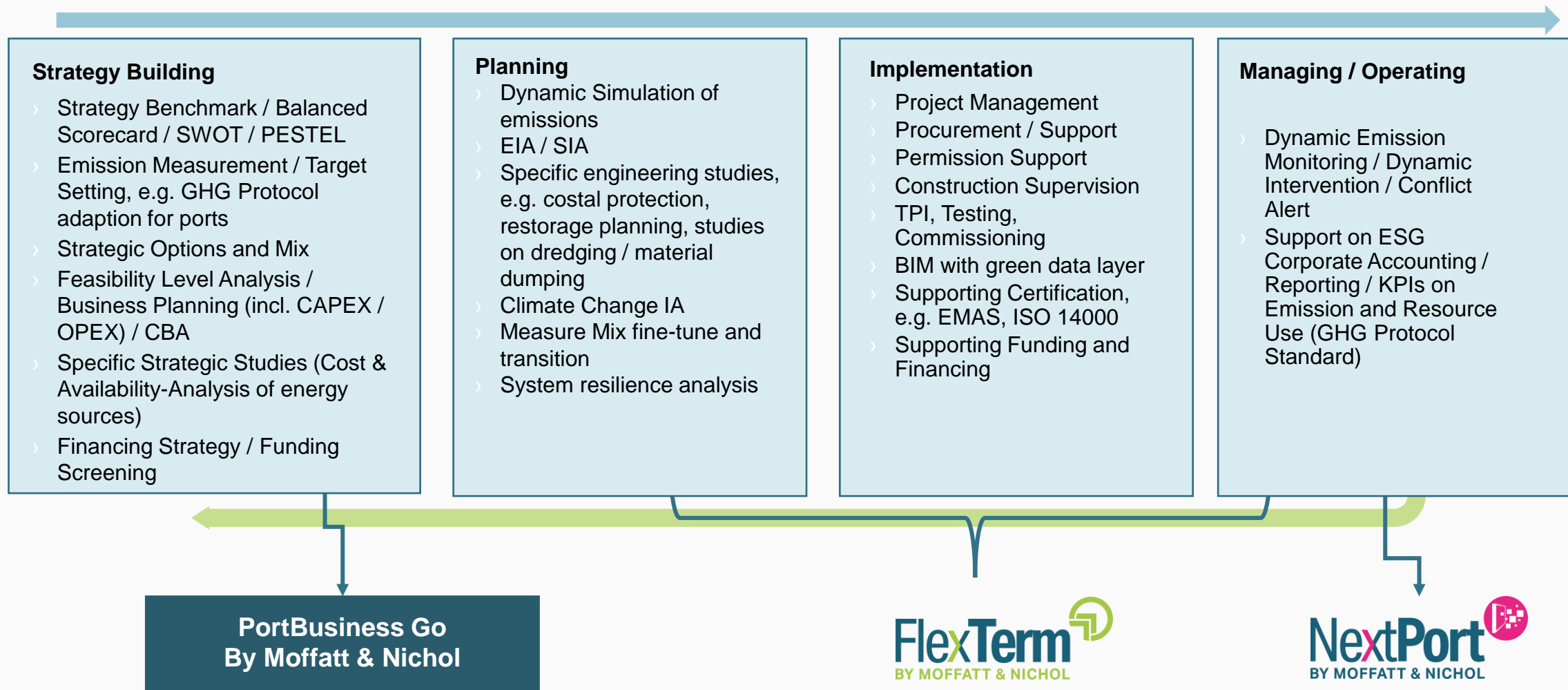
GreenPort Go – Energy Transition

› Investing in a New H₂-carrier Terminal



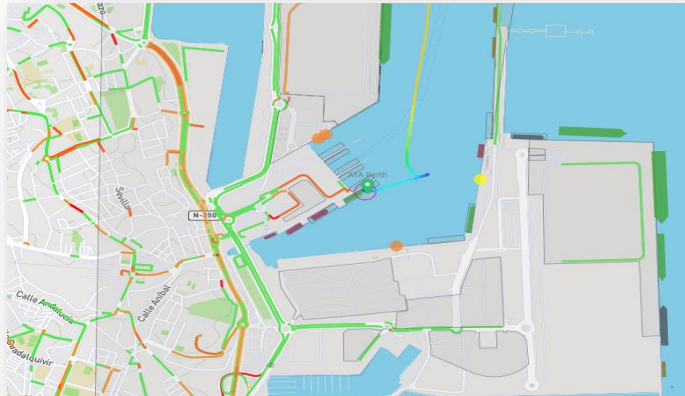
GreenPort Go – Digital Tools

› Developing our Toolkit towards SEG



GreenPort Go – Digital Tools

› The Future

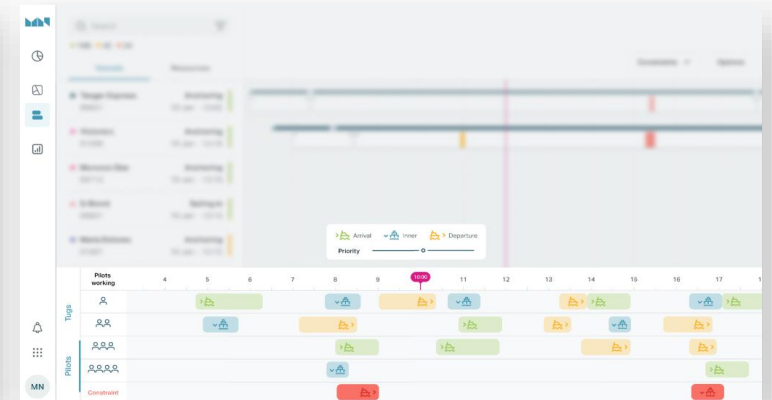


Port Digital Twin
 >> Emission Monitoring

Berthing

	Berth 0	Berth 1	Berth 2	Berth 3	Berth 4	Berth 5
1:00	01500	01500	01500	01500	01500	01500
2:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
3:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
4:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
5:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
6:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
7:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
8:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
9:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
10:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
11:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
12:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
13:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
14:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
15:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500
16:00	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500	Tanger Express 01500

OPS Visual Management
 >> Dynamic Measure Dashboard

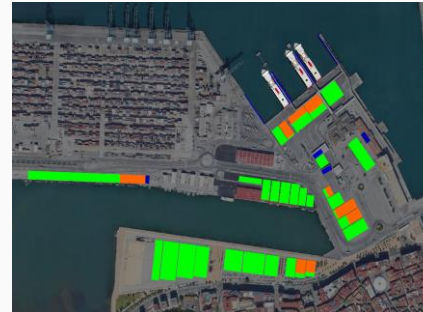


AI Models
 >> Conflicts Alerts



Data Analytics (Balance Scorecards)

Port Simulator
 >> FlexTerm



What-If-Scenario Analysis

Thank You

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