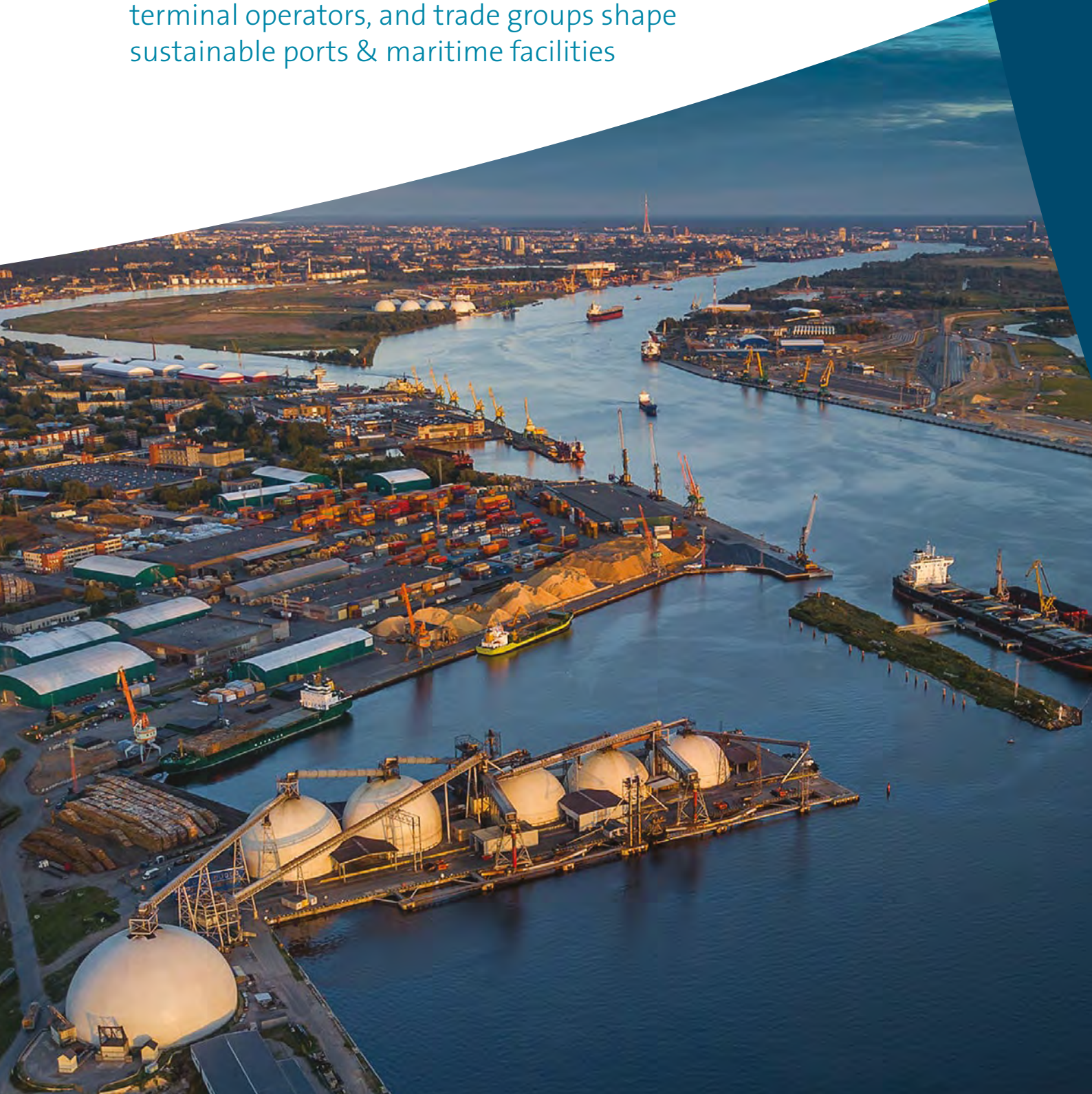




**Royal
HaskoningDHV**
Enhancing Society Together

Green port consultancy services

A guiding hand to help port authorities,
terminal operators, and trade groups shape
sustainable ports & maritime facilities



CREATE GREENER PORTS FOR A BRIGHTER FUTURE

The pressure on ports to become more sustainable is increasing worldwide, with companies, stakeholders, and investment funds wanting to see proof of sustainable practices. The changing climate is impacting port operations, and evolving national and international regulations for maritime decarbonisation mean that adopting green solutions is no longer a choice – it's a necessity.

It's time to put sustainability actions at the core of your maritime business. But with so many aspects to consider – like infrastructure, operations, environmental impacts, and energy use – it can be difficult to know where to start.

At Royal HaskoningDHV, we understand the challenges of operating efficiently, delivering growth, and improving sustainability in a sensitive marine environment.

We've worked on projects across the globe with port authorities, terminal operators, trade bodies, and international financial institutions – and can bring all that experience to your port, terminal, or shipyard.

We have experts in maritime design, masterplanning, environmental impacts, alternative energy, and economics that can deliver a tailored blend of maritime-specific technical, environmental, and financial advice. Our specialists use a combination of local knowledge and global expertise to identify solutions that meet your sustainability goals.

With our maritime consultants at your side, you can be sure that our solutions are robust and deliverable – ready to support you into a greener future.



WORLD-LEADING EXPERTISE TO SUPPORT YOUR SUSTAINABILITY JOURNEY



Local knowledge backed by global experience

Our robust approach to understanding your local context, combined with our global resources and experience in the international maritime market, means we can tailor suitable, best practice solutions for your facility.



Sustainable solutions that protect business continuity

We understand that sustainability solutions need to be developed alongside existing operations. Our decades of maritime experience mean we know how vital business continuity is to sustainable growth, and we have a strong record of providing solutions that minimise disruption.



Support for decarbonisation in an evolving landscape

Helping clients decarbonise is one of our core services – supporting the urgent transition to Net Zero. We provide guidance within a rapidly changing regulatory landscape, ensuring you can deliver compliant outcomes with confidence.



OUR MARITIME CONSULTANTS ARE READY TO SUPPORT YOU AT EVERY STEP

Green port strategy development

Having a comprehensive view of your facility's current level of sustainability will demonstrate your commitment to stakeholders and potential investors. It puts you into the best position to identify and carry out the most appropriate initiatives to reduce emissions and waste, while improving efficiency and enhancing biodiversity.

Our green port health check takes a holistic review of your facility's current status. This scored result gives a baseline from which you can monitor progress. Using this output, we then guide you through the development of a green port strategy, creating ambitious goals that are realistic, clear, and deliverable.

We then delve into your priorities, targets, and existing ideas to establish an appropriate vision for your sustainable development strategy. We help you craft a strategic roadmap of actions to deliver your vision. To support delivery, we can also provide advice and design robust monitoring and reporting systems to track progress.

Port decarbonisation strategy development

You can rely on our expertise to support you on your journey towards carbon neutrality and Net Zero.

We review current policies and regulations applicable to your port or maritime facility's location, to understand which targets you will need to meet and when, as well as the potential opportunities such as funding access to support your decarbonisation journey.

Our extensive experience of port operations and technology, coupled with our experience conducting alternative fuels studies and implementing renewable and energy efficient power solutions, means we can also use the baseline emissions data to identify the best options to deliver improvements and emissions reductions.

We then bring these together into a roadmap of time bound interventions to communicate actions that need to happen, and when, in a digestible format. Our financial and economic experts are also on hand to build robust business cases to support investment in decarbonisation.

Electrification and shore power strategy and feasibility

We offer industry-leading services for port electrical infrastructure, shore power implementation, electrification of equipment and the use of renewables in ports: all key elements in decarbonisation and pollution reduction in port cities. Our first step is to gather all data on the existing system and then undertake a power systems analysis study to ascertain the existing network's capacities. This helps us understand the network limitations which need to be addressed for new electrical components to be added into the distribution system. By having the existing electrical infrastructure modelled we can then run multiple scenarios which may include electrifying equipment, introducing local renewable generation, and incorporating peak shaving and load balancing via a dedicated power management system. Once a project is developed it can be added to the model to form the baseline for the next project, as it gives a true reflection of what is now installed. The model can also become the first step in the digital twin journey.

Alongside the wider electrical infrastructure considerations, shore power supply is a significant consideration for ports and ship operators alike. Royal HaskoningDHV offers a complete, full-service package and can provide services ranging from the initial study right through to the construction support of your shore power solution.

Green shipping corridor strategy

We provide strategic advice to ports who are looking to position themselves as hydrogen hubs, green energy exporters, port of call for renewable bunker fuels, and for ports who are embracing the IMO targets and the outcomes of the Clydebank Declaration. Our services include market studies to understand port's potential to act as an energy exporter or new fuel bunkering hub; advice on the potential future pathways to decarbonise shipping and spatial planning; and infrastructure upgrade advice to facilitate the supply of electricity and alternative fuels.

We also provide quantitative risk assessments to understand the implications of the energy transition process on port infrastructure and operations. We support ports with their role in managing their own assets, and we support industries connected to the port and its position in the development of the region.

Climate resilience assessment

At the interface of land and water, maritime facilities are acutely susceptible to climate change impacts: from rising sea levels and flooding to operational disruptions caused by wind or extreme heat. To protect your facility, you need to understand potential increased climate risks and prepare a locally specific adaptation plan.

Our team provides industry-leading guidance for climate change adaptation in ports, combining expertise in multi-hazard climate change risk analysis and extensive experience in maritime design and operations. We'll define the scope of a climate resilience assessment for your facility, undertake climate change risk and vulnerability assessments to identify the critical assets and operations at risk, and prioritise adaptation measures to inform the development of a resilience plan and investment rationale.

Sustainability and climate-related disclosures guidance

Our team excels in guiding businesses toward Science-Based Targets that align with global climate goals. Through meticulous analysis and strategic planning, we assist in setting ambitious sustainability targets, fortifying your path towards a low-carbon future.

Our specialists will simplify the reporting process, enabling accurate, transparent, and impactful financial and non-financial disclosures. We assess the potential financial impacts of these hazards on your assets and operations, ensuring a comprehensive understanding of transition risks. With a dedication to sustainability, innovation, and excellence, we partner with you to build a resilient and sustainable future. Our team stands ready to assist you in identifying optimal adaptation and mitigation strategies, turning climate challenges into strategic advantages.

Environmental Social Impact Assessment (ESIA) and management for ports

An ESIA is more than a regulatory tool, it's a way to raise a project's benefits for you, as a project proponent, your environment, and your neighbours. The ESIA will help you engage stakeholders, identify opportunities to enhance your environmental and social performance, and ensure a Social License to Operate.

Our multidisciplinary teams take an integral approach to the impact assessment process. Royal HaskoningDHV blends technical expertise in soil, water, air, waste, ecology, legislation, and social expertise, with architectural, engineering, logistics and infrastructure knowledge.

Our multidisciplinary teams can easily integrate environmental and social opportunities into design, construction methods and operational practice. Our practical project management experience allows us to guide a project from concept stage through to eventual permitting and approval.



Social and environmental due diligence (ESDD)

At Royal HaskoningDHV, we have an extensive track record in performing environmental, social, and health and safety (EHS), governance (ESG) and technical due diligence assessments to support investments and acquisitions.

We provide environmental and social due diligence at a strategic level to give perspective on opportunities and risks at all stages of the investment cycle. We use International Standards, like IFC, World Bank, and Equator Principles. And our approach identifies potential hidden costs, translating issues into clear expenditure projections.

From our experience in many projects, we can suggest feasible and effective measures to mitigate any risks. As a result, you'll get a comprehensive report (an Environmental and Social Action Plan (ESAP)) of our key findings and their implications.

Green port master plans

Royal HaskoningDHV is a global leader in the preparation of port master plans. The port planning process is generally focussed on defining the future long-term development of the port area (often over 25 years) and more immediate requirements for the coming few years.

As part of the masterplanning process our environmental experts carry out baseline and preliminary environmental assessment and organise base-line surveys. Equally important to consider are social conditions, by assessing the communities living in the area and their livelihoods.

As part of the master planning process, we also regularly deliver green port workshops to help you to identify opportunities to integrate more sustainable solutions at a stage in the design when it is more efficient to plan and adopt these changes, and perhaps include a parallel strategy development as part of the masterplan.

Port-city integration assessment and design

As city populations continue to grow, historic urban ports face increasing pressures, and you need to balance essential trade functions with other civic needs. Whether that means optimising or relocating your facility, we're here to facilitate and support your transformative journey.

Our team collaborates with landowners, port authorities, operators, and local authorities to ensure your assets can deliver maximum value. Our approach is adaptable to your specific needs, whether it involves a comprehensive assessment and design of the entire port estate or a focus on one particular aspect of your facility. Goals may include enhancing the safety, efficiency, and user experience of a new cargo or passenger terminal, unlocking land potential by developing business cases for different development pathways, or formulating a new urban port masterplan. We are equipped to support you with these goals.

Nature-based solutions design

Nature-based solutions (NBS) offer an opportunity to tackle socio-environmental challenges – including climate change, water security, and flood risk – while protecting and optimising your maritime facility.

We bring together our expertise in environmental impacts and maritime design to identify innovative solutions that deliver for ports and their surrounding ecosystems. Additionally, we explore mutual opportunities for co-financing and multi benefit mechanisms in NBS to adapt and develop more climate resilient infrastructure and operations. By leveraging the multiple benefits of NBS, we seek to identify and explore joint opportunities, financing and impactful win-win solutions (such as through green financing and sustainability-linked financing instruments) to build climate and economic resilience in ports' investments, operations, and business lines.



CASE STUDY

Consulting on climate change adaptation at the Port of Banjul

The Port of Banjul needed to increase its cargo and storage capacity to meet increasing demand. But climate change made expansion and future development difficult to plan. To obtain funds for the expansion, the port needed to provide clear climate change analytics and adaptation investment options.

The Global Center on Adaptation (GCA) appointed Royal HaskoningDHV and Lobelia Earth to investigate the climate change vulnerability of the Port of Banjul. We analysed high-resolution, multi-hazard climate data and performed a vulnerability stress test to identify and quantify critical climate change-related risks on port infrastructure and operations.

We discussed the port's key physical climate change risks with stakeholders through a virtual multi-stakeholder dialogue and gained relevant feedback to prioritise adaptation options.

This structured approach helped the Gambia Port Authority make effective adaptation and resilience investment decisions to tackle the most pressing climate change risks while maintaining its cashflow and put climate resilience at the forefront of its cargo expansion project.

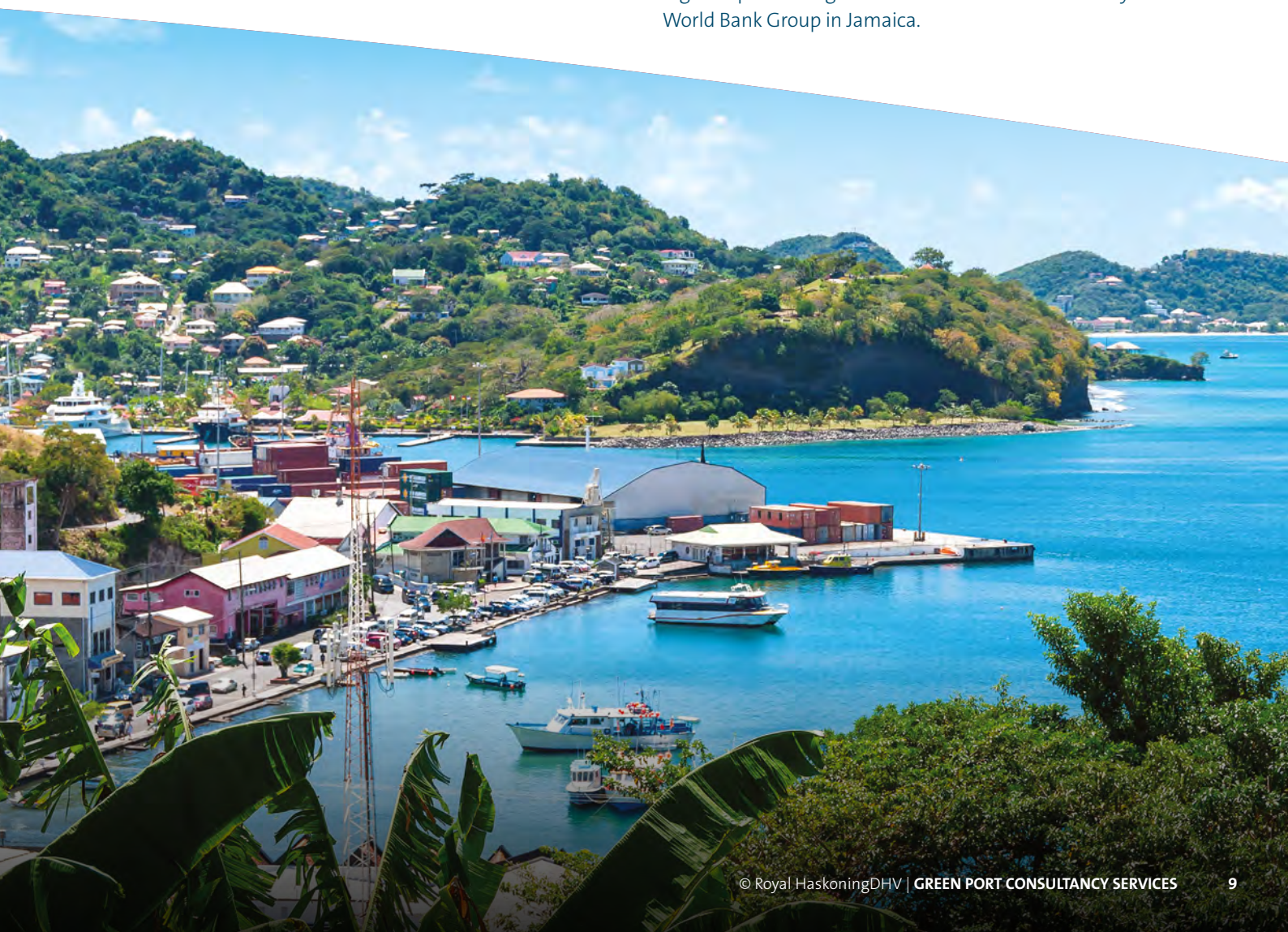
Developing Blue Ports in the Caribbean

PROBLUE champions the development of integrated, sustainable, and healthy marine and coastal resources – including blue economy initiatives for ports in the Caribbean region. To boost resilience, connectivity, and sustainability, PROBLUE needed to determine the maturity of different ports, and the right projects to implement blue economies.

We worked with PROBLUE and the maritime community to identify opportunities to strengthen and diversify blue port economics. By scoring 140 projects against each port's policy, legislative, industrial, and operational capabilities, we helped PROBLUE prioritise potential blue port initiatives.

We developed a multi-faceted framework tool with nine key maturity indicators to measure each port's climate resilience, shipping service connectivity, and environmental and emissions management. This tool was used to identify improvements for ports in Jamaica, Belize, St Lucia, Grenada, and the Dominican Republic, to seek out future investments.

After careful assessment, we identified 20 investment projects for ongoing consideration by PROBLUE to boost blue economies in the Caribbean maritime industry. To generate further commitments, we presented and workshopped the projects with representatives from regional ports and governments at an event hosted by the World Bank Group in Jamaica.



The Port of Apia successfully embraces green port strategies

The Asian Development Bank (ADB) and Samoa Ports Authority (SPA) wanted to upgrade the Port of Apia's infrastructure. We supported the port to create safer and more efficient operations, as well as adopt new technologies, embrace environmental sustainability, and look after the well-being of its staff.

We set a vision for Apia Green Port – covering green strategies, disaster management, and gender equality. Our support included:

- Defining policy commitments and priorities for each aspect of the vision and preparing a plan that engaged stakeholders
- Assessing the port's current sustainability, resilience and efficiency with a green port health check – following principles from international best practice guidelines like ISO14001
- Identifying targets and KPIs, while prioritising the most suitable green port initiatives

We assessed 42 potential initiatives focused on operational efficiency, environmental management, disaster preparedness, climate resilience, and social sustainability.





CASE STUDY

Assessing physical climate risk for resilient port design in the United Kingdom

Peel Ports Group is the second largest port group in the UK. It's already investing in more sustainable and efficient services – and aims to become a net zero port operator by 2040. However, the group wanted to better understand its vulnerability to climate change and how best to adapt operations.

The group partnered with Royal HaskoningDHV to conduct a comprehensive assessment of its operations in the UK and Ireland. Working with local teams, we analysed various climate change scenarios projected over the next 100 years. We used our TWINN hazard datasets to determine the likelihood and impact for a full range of physical climate hazards, including rising sea levels, rainfall, heat, and more. Our report recommended changes to operational processes and proposed the enhanced monitoring of weather conditions and their impacts. These modifications aimed to improve the port's understanding of its asset vulnerability and help it track changing conditions more effectively.

Implementing the report's recommended actions is expected to minimise the risk of damage to assets and the potential operational downtime which might occur during extreme weather events. The report allows Peel Ports Group to plan for the next 100 years of operations with greater resilience to climate change.

About Royal HaskoningDHV

Royal HaskoningDHV is an independent and employee-owned company dating from 1881 integrating engineering, design, consultancy, software and technology to deliver more added value for clients. Through our mission Enhancing Society Together, we take responsibility for having a positive impact on the world and contribute to UN Sustainable Development Goals. We constantly challenge ourselves and others to develop sustainable solutions to local and global issues related to the built environment and the industry. Backed by the expertise of around 6,000 colleagues working from offices in more than 25 countries across the world, we are helping clients with challenges ranging from climate change and digital transformation to changing customer demands and the energy transition.

We're ready to help

If you'd like to learn more about our green port consultancy services, contact our **maritime consultants** today:

✉ maritime@rhdhv.com



royalhaskoningdhv.com/maritime