

Renewable Energy

# Empowering the Sustainable Delivery of Clean Energy Solutions

Hydrogen  $H_2$   
zero emission

The greatest challenge facing the renewables sector is to increase the supply of decarbonised power capacity to meet the needs for our future generations.



The need for reliable grid and storage solutions calls for clarity and know-how to make smarter, sharper decarbonisation decisions.



# Global trends and challenges in the renewables sector

The world's economies, whether emerging or developed, depend on the availability of reliable, low cost and clean power. The power sector is navigating a series of changing market forces such as the balance between cost, security and decarbonised energy.

## **There are two main challenges facing the power industry:**

- Providing electricity to the population of the world's emerging economies while modernizing the transmission and distribution system in the world's developed economies
- Ensuring the reliable delivery of energy in a world wanting to move to renewable and storable forms of clean energy while leveraging distributed generation technology and resources

These challenges are compounded by the ambition to decarbonise power generation while remaining cost-effective and mitigating climate impacts.

## **We help our clients address these demands in a number of ways, including:**

- Supporting new market entries by assisting our clients to manage their portfolio risks
- Providing advisory support to navigate and assess the feasibility of renewable and storage solutions
- Supporting development of the capital projects portfolio
- Addressing EHS performance improvement issues such as the implementation of global audit programs, including the development of leading edge behavioural-based safety programs
- Creating and implementing strategies and tactics to sustainably retire assets and to support the redevelopment of brownfield sites for renewed economic development

# ERM helps clients across their Investment and operational lifecycle



## Taking a Boots to Boardroom Approach

ERM understands that every renewable project presents a unique set of environmental, health and safety, and sustainability risks and liabilities which require rapid and rigorous quantification, timely approvals and development, and compliant operations and execution.

For over 50 years, we have been providing critical, time-sensitive advice on environmental risks to assist companies execute key renewables transactions and projects.

With unrivalled global capabilities and in-depth understanding across the financial, commercial, and industrial sectors, we use a boots to boardroom approach, alongside scenario-based planning to provide cradle to cradle renewables:

- assist in site selection
- anticipate and manage environmental and social risk permitting
- engage with relevant stakeholders and advise on landowner negotiations
- develop assets and environmental management through operation to site closure and decommissioning.

## Proven, Deep Technical Expertise

In pursuit of providing proven technical expertise, modelling tools and policies to accelerate low carbon energy and clean hydrogen, we have extensively incorporated solutions and offerings, alongside our recent acquired companies, including **RCG**, **E4Tech**, **Element Energy** and **ARCUS** – providing proven, deep technical expertise on fuel cell, carbon capture and hydrogen projects.

With long-standing experience in advising public sectors and private sectors, we are able to design, and develop renewables and hydrogen roadmaps, and execute the projects with a right mix of technology, processes and systems, to navigate through the complexity seamlessly, and efficiently.



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## New Site Selection and Entering New Markets

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ERM develops renewables strategies and market assessments, market entry, customised research, due diligence and technical advisory:

- Go-to-market analysis, early stage development services, levelised cost of energy, project feasibility and site selection
- Go-to-market plans, strategic renewables masterplans, technical advisory
- Bid strategy, bid management and associate technical inputs

We also conduct EHS due diligence for acquisitions, divestitures, mergers, joint ventures, and capital raising include:

- EHS due diligence for project finance including Equator Principle reviews
- Analysis for bankruptcy, reserves, provisioning, asset retirement obligations, and financial reporting
- Carbon and energy due diligence
- Post-merger integration support
- Management systems, EHS culture, gap analysis, and benchmarking
- Incorporating social, stakeholder, and sustainability elements into due diligence



## Planning and Permitting: Delivering Capital Projects

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ERM provides a wide range of services to assist our clients with the planning, permitting, construction, start-up, and operation of new capital projects. These services include the following:

### Definition - Assist in developing projects:

- Stakeholder mapping and issues identification
- Site/route selection
- Project planning
- Sustainable master planning
- Technical Advisory
- Permitting feasibility studies and risk assessments
- Permitting strategies and plans
- Design and construction support to avoid and mitigate impacts

### Assessment - Identify impacts and mitigations:

- Licensing and permitting
- ESHIA/ESIA/EIA/EIS/EA
- Government/regulatory reviews and approvals
- Lender approvals
- Development of management plans and systems
- ESMP development and implementation

### Construction and operation - Assist with project implementation:

- Management planning and ESMP implementation
- Construction oversight and management support
- Represent as owner's engineer and lenders technical advisor
- Monitoring and evaluation
- Stakeholder engagement

Our GIS and data management services provide support throughout the project lifecycle.

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## Improving Operational EHS Performance

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- **Policy, strategy, governance, and standards:** Assisting in meaningful and effective sustainability policy and strategies for improving EHS, social, and business outcomes, and developing clear technical, management, and operational standards.
- **Health and safety at work, environment and social aspects and impacts, and compliance obligations:** Providing clarity and deep understanding of potential risks and opportunities, current and likely future compliance obligations, and occupational health and safety, environment, and social aspects. Whole business and site risk profiling, benchmarking, legal register, horizon scanning, and impact analysis.
- **Product portfolios:** Addressing the opportunities and costs associated with intense interest in the environmental impacts of products and the increasingly complex regulatory requirements that apply to them. Life cycle assessment and management, design for environment, REACH and WEEE, other product regulatory regimes and take-back requirements, and design and execution of supply chain assessment programs.
- **Management systems and processes for robust EHS performance:** Enhancing and streamlining established management systems and core processes to ensure these support the achievement of improved HSE and social outcomes and core business objectives.
- **Knowledge and skills to address the challenge:** Assessing competency needs and using high impact training techniques to provide leaders, EHS functional staff, and the front line with the required knowledge and skills to successfully address these challenges.
- **Information management:** Developing and implementing data management solutions, working with the world's leading software providers to support real time needs for data and information to support decision-making and growing external reporting needs as well as supporting improving operational efficiency and reliability
- **Audit and assurance for risk reduction:** Evaluating, designing, and delivering assurance programs that are fit for purpose at each level and function. Audit program development, auditor training, compliance auditing, performance focused auditing for behavioural change, third-party certification and verification of GHG, reports, and management systems.
- **Sustainability reporting:** Addressing the increasing need for transparency and rigor in communications with an increasing array of external stakeholders who have an interest in EHS and social performance.

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## Managing Retired Assets

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Whether the need is decommissioning a single facility or fleet, ERM understands the complexities and project risks involved in retiring assets. From initial planning and asset characterization through scope development, contracting and execution, culminating with potential asset divestiture and redevelopment, there are many critical steps involved to ensure that a decommissioning and redevelopment project provides the highest value to the owner in a safe and technically compliant manner.

ERM can assist your organization as a trusted advisor in this area and can provide the following services:

- Risk characterization: including development of an environmental, health and safety compliance matrix, permit review and identification of hazardous materials/wastes that require special handling
- Project planning – including reserve cost estimates, comprehensive scope definition, and task sequencing
- Asset valuation – including equipment and recyclable building materials
- Project management/execution – as the owner’s engineer or turnkey project dependent on owner’s acceptable risk profile
- Asset monetization/purchase of qualifying properties, including acceptance of associated environmental liability. ERM and our asset liquidation and brownfield redevelopment team members share a specific interest in repurposing retired power generation sites for sustainable long-term use.



# Providing Hydrogen Expertise from production to a variety of end uses



## Strategy advisory

Analysis of strategic options to engage with emerging hydrogen opportunities with a particular focus on industrial strategy, and policy/regulatory interactions



## Understanding technology commercialization

Analysis of supply chains, industry insights as trusted advisors, manufacturing strategies and go to market plans



## Techno-economic feasibility

Detailed cost estimates, financial modelling, funding/financing, financial analysis and technical options evaluation for new projects



## Development of hydrogen projects

Technology selection, business case development, project management/delivery, energy supply and H2 off-take negotiations



## Stakeholder engagement

Managing groups of stakeholders to achieve progress in specific H2 sectors



## Hydrogen hazard assessment and risk assessment

Hydrogen production facilities, storage and pipelines



## Safety & environmental consent

Delivery for projects (Planning, EIA, Seveso III, Permitting).



## Lifecycle assessment and CO2 analysis

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## About ERM

*ERM is the business of sustainability.*

As the largest global pure play sustainability consultancy, ERM partners with the world's leading organizations, creating innovative solutions to sustainability challenges and unlocking commercial opportunities that meet the needs of today while preserving opportunity for future generations.

ERM's diverse team of 7,000+ world-class experts in over 170 offices in more than 39 countries supports clients across the breadth of their organizations to operationalize sustainability. Through ERM's deep technical expertise, clients are well positioned to address their environmental, health, safety, risk, and social issues. ERM calls this capability its "boots to boardroom" approach - a comprehensive service model that allows ERM to develop strategic and technical solutions that advance objectives on the ground or at the executive level.

## ERM Group of Companies



E4tech is an energy and sustainability strategy consultancy specialising in innovative and disruptive low-carbon technologies.

E4tech complements ERM's capability in:

- Bioenergy & Biochemical
- Sustainability & Resources
- Fuel Cells & Hydrogen
- Low Carbon Transport
- System Transition Enablers
- Innovation & Policy



RCG is a global market intelligence, management consulting, and technical advisory firm operating exclusively in the renewable energy sector. RCG supports clients across the entire lifecycle of large-scale renewable energy projects:

- Market Intelligence
- Strategy development
- Offshore Wind
- Onshore Wind
- Solar
- Emerging renewable technologies (e.g. wave, tidal, and high altitude wind power)



Element Energy is a specialist energy consultancy that implements integrated low-carbon technology solutions to help solve client's net zero and decarbonisation challenges. Element Energy brings deep expertise in the development, commercialisation and implementation of emerging low-carbon technologies:

- Hydrogen and fuel cells
- Electrification
- Built Environment and Low Carbon Transport
- Smart Energy Systems
- Energy storage
- Carbon capture use and storage (CCUS)