



TECHNOLOGY PERFORMANCE INSURANCE: RISK SOLUTIONS FOR THE ENERGY TRANSITION

Summary Report From Spring 2022 Event

The energy transition to clean and renewable sources is underway. Growth is in low-carbon solutions, and clients consistently use new, improved technologies in their projects. But these new methods are expensive and create new risks. Technology Performance Insurance is an increasingly relevant insurance coverage that supports a wide range of clean technologies and helps projects scale by addressing the risk of under performance.

Mike kicked off the webinar and highlighted the current energy transition and evolution of the energy industry. Next, Stefan discussed the evolving risk landscape the shift to clean energy is creating, along with impacts of ESG (Environmental, Social and Governance) on the insurance sector. The foundation was laid for Stefan and George to discuss benefits of Technology Performance Insurance touching on the growth of the market, client motivation for obtaining the coverage, and the underwriting and quote process.

It was a popular event with a broad mix of attendees across the energy vertical with representation from technology firms, equipment manufacturers, developers/owner-operators, investors, and other professional services, including representation from Canada, Latin America and Europe.

The Webinar Brought Together a Panel of Speakers:



Mike Hogue
Managing Director
Gallagher's Global Energy Practice



Stefan Szulc
Executive Director
Gallagher's Global Energy Practice

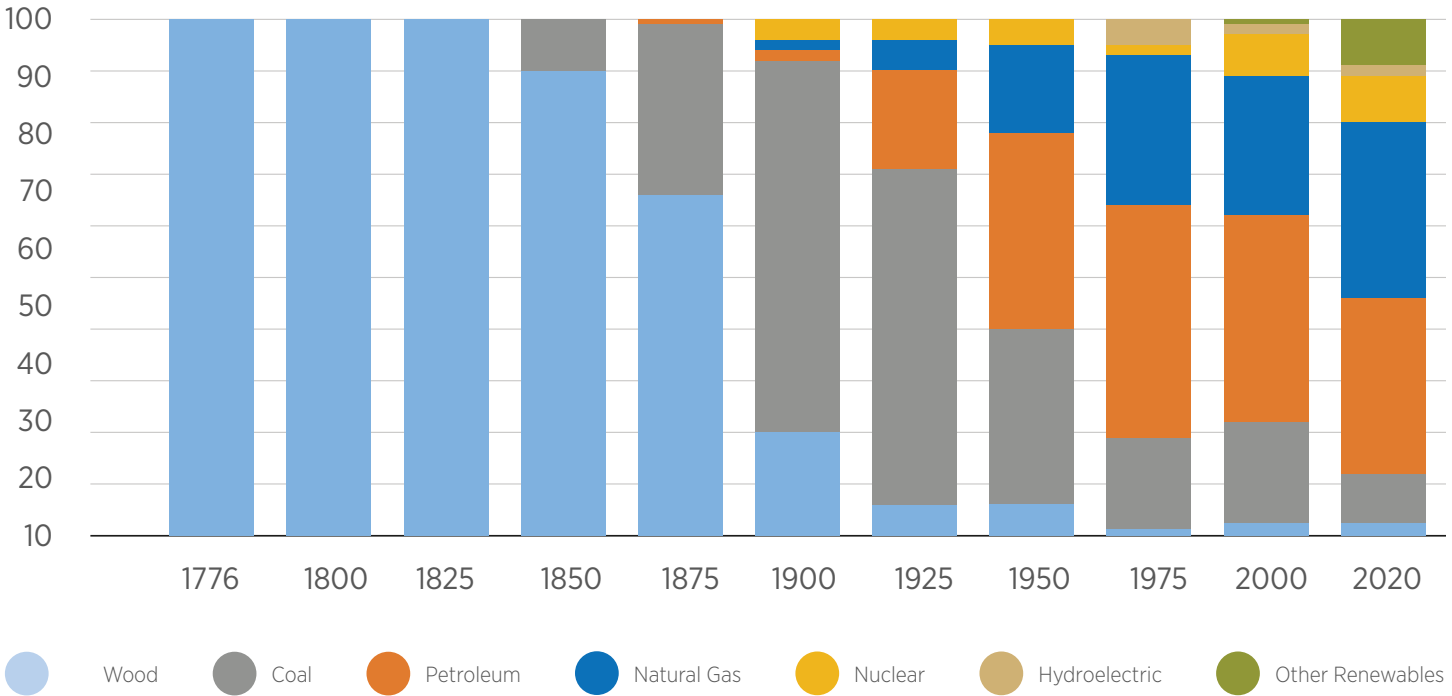


George Schulz
Leader Americas
Ariel Re Clean Energy Risk Solutions

EVOLUTION OF THE ENERGY INDUSTRY

Energy transitions are not new as evidenced in the chart below. Over the previous 200+ years, U.S. energy consumption evolved from wood to coal to oil and gas. Current environmental, geopolitical and technological forces are driving the shift away from fossil fuels to a more thoughtful mix of energy generation that reduces greenhouse gas emissions.

Shares of total U.S. energy consumption by major sources in selected years (1776-2020)

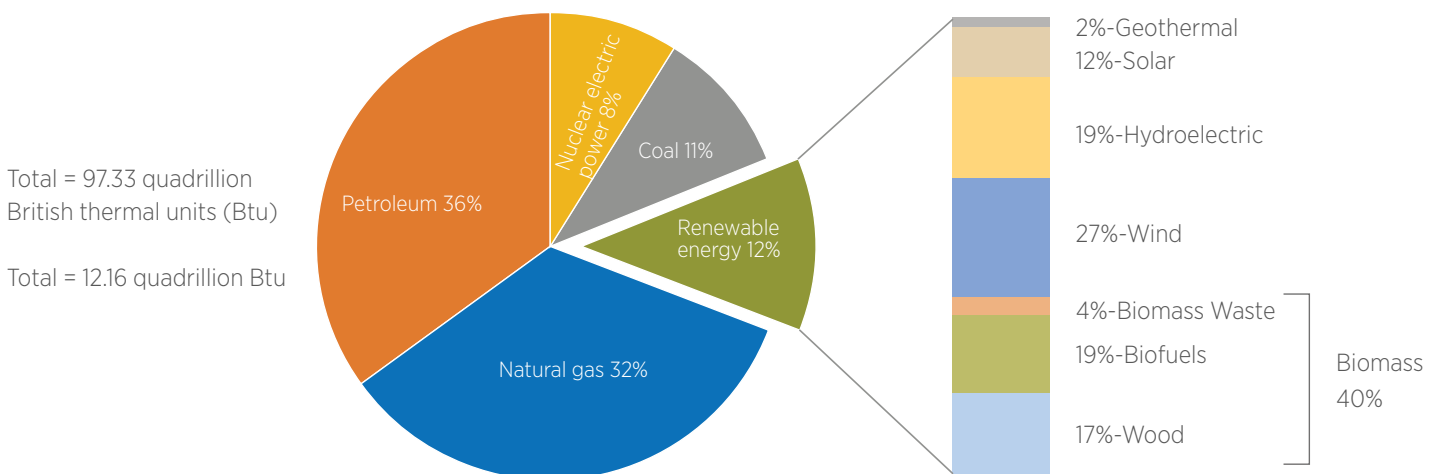


Source: U.S. Energy Information Administration, Monthly Energy Review, Appendix D.1, and Tables 1.1 and 10.1, April 2021, preliminary data of 2020.

GROWTH IS CLEAN

Renewable energy is currently less than 15% of U.S. energy consumption, but renewables are expected to continue to be the fastest growing class of energy for a handful of reasons including better products, falling prices and a desire for energy independence. In fact, according to the U.S. Energy Information Administration, U.S. renewable energy hit a record 28% in April 2022, driven primarily by wind and solar installations dominating U.S. energy project development.

U.S. Primary Energy Consumption by Energy Sources, 2021



Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1 April 2022, Preliminary data.

Note: Sum of components may not equal 100% because of independent rounding.

INSURANCE SUPPORTS GREEN EXPANSION

Insurers are playing a key role in addressing climate-related risks. What's "insurable" is changing with expanding underwriting appetite and the creation of new risk transfer products to support clean energy innovation.

In addition to traditional property and casualty coverages, specialty insurance facilitates project development and helps achieve low-carbon goals.

Examples:

- **Technology Performance Insurance**—ensuring new projects and processes work as expected
- **Tax Indemnities**—protection against IRS challenges related to tax credit qualification (ITC, PTC, 45Q)
- **Representations & Warranties Insurance**—coverage for seller breaches in M&A transactions
- **Credit Enhancement**—default protection from off-takers, vendors and customers
- **Parametric Solutions**—alternative capital for weather risk

Impact of ESG on Insurance

The **Environmental, Social and Governance** agenda is an increasing priority for the insurance sector.

As insurers incorporate ESG factors and determine opportunities and risks, there's a shift in underwriting appetite away from fossil fuels. Carriers are under pressure to distance themselves from clients whose activities have a perception of destroying the environment and contributing to climate change.

As a result, more insurers are competing for renewable energy business, including developing specialty products that support green expansion.

TECHNOLOGY PERFORMANCE INSURANCE

Enabling clean technology businesses to achieve commercialization, profitability and scale.



Written Since 2009 Covering:

- Equipment Suppliers
- Project Developers
- Asset Owners
- O&M Providers
- M&A Support



EXPANDING INSURANCE MARKET AND PRODUCT OFFERING

Origins date back to 2009, when insurance products developed from demand in the market to backstop long-term liabilities for PV Solar module manufacturers. With the strong tailwinds of climate concerns and increased focus to achieve of ambitious 'Net Zero Carbon' goals, these products have evolved not only in the solar market to include variation in performance risk, revenue shortfall and irradiance cover but beyond solar to other compelling technology platforms.

George explained that his underwriting team is comprised of experienced professionals with various backgrounds in science (chemistry), engineering, finance, and insurance to not only evaluate the technology risks, but also understand the commercial risks of the various stakeholders in the value chain.

UNDERWRITING APPETITE

Solar PV Module Performance

Backstops the PV module manufacturer's original Performance Warranties.

Applicable to both brownfield and greenfield projects; ground-mounted, rooftop and floating solar.

Solar Project Performance

Covers long-term project cash flows through Performance Ratio or MWh Guarantee (includes irradiance risk).

Applicable to project sponsor, EPC, O&M, lender; single large utility projects, global portfolios of asset managers, or C&I and residential portfolios.

Fuel Cell System Performance

Backstops the manufacturer's original Electrical and/or Thermal Performance Warranties.

Flexible to insure manufacturers' global sales (balance sheet protection) or dedicated customer sales.

Energy Storage Performance

Backstops the manufacturer's original State of Charge (SoC) Performance Warranties.

Coverage may include the battery management system (BMS) for utility-scale, commercial and residential site applications.

Bioconversion Performance

Start-Up and Operational Risk Cover for Biomass, Waste to Energy and Syngas, Gasification technologies.

Flexible investment protection structures:

- Pre-COD—a start-up commissioning risk cover for repair cost and/or debt repayment.
- Post-COD—a guarantee of project output and quality of end-product; operational and excessive maintenance risks.

Other Technologies

- Hydrogen Economy
- Energy Efficiency
- Carbon Capture
- Water Treatment
- Industrial Processes

CLIENT MOTIVATION

Coverage can be placed at either the corporate level for technology firms or the project level for developer/owner-operators and investors. Policies especially appeal to companies without a track record or balance sheet. Traditionally a project developer might look to an EPC contractor for this type of coverage via a performance “wrap”, but that’s not available to new or unproven technologies or processes.



Improve Financial Strength

- Highly rated insurance policy backstop
- Balance sheet protection
- Lender confidence improved
- Reduce cost of finance
- Improve warranty and servicer strength
- Improve equipment sales opportunity

Long-term Cover (Noncancellable)

- Policy term—up to 25 years for solar/12+ years on other asset classes
- Enhance investment case—mitigate technology and operational risks
- Improve project bidding profile—market differentiator
- Broaden investor base—improve overall asset valuation and ROI

Tailored Policy Scope

- Comprehensive cover with clearly defined insured events (aka Named Technical Perils including defects, degradation, serial losses)
- Expert technical review of projects
- Clear claim verification process
- Flexible cover options to include Start-Up and Operational Performance Cover
- Product innovation: insure risks that satisfy lenders’ requirements
- Hybrid projects with a combination of technologies

UNDERWRITING ROADMAP

Underwriters evaluate each technical risk based on demonstrated performance, preferably in-field at a demonstration plant. The demonstrable performance may come in the form of lab data, market experience or perhaps third-party independent studies. At the core of risk assessment is the ability to build a ground-up view of the risk, define causal failure modes in order to model, and risk-price in the setting of a warranty or financial risk.



Steps To Receive an Indication of Interest:

1. Introductory meeting/conference call with Client.
2. Execution of NDA.
3. Submission of Initial Questionnaire by Client (and/or access to Client's data room).
4. 'Desktop Underwriting': Development of nonbinding indication (NBI) with terms and conditions, and related premium and structure(s) based on Client input and its stakeholders, along with any additional information request or clarification of existing Submission.
5. Presentation of Letter of Intent (LOI) to Client, with technical risk analysis fee ("TRAF"), refundable at Policy execution, to fulfill underwriting conditions (i.e., further due diligence, policy wording development) to confirm technical risk assessment and finalize a Binding Offer of Insurance (BOI).

PROCESS TIMELINE: 3-6 weeks
(subject to availability of information)

Additional Steps for an Executed Policy:

1. Final due diligence.
2. Site visits (e.g., pilot plants, demonstration plants, project sites) and/or other stakeholder meetings (i.e., Finance Lenders/Investor, EPC, other Contractors/Developers).
3. Detailed data inspection/analysis (e.g., permits, project financial model, heat-and-material balances, supplier warranties).
4. Policy wording development to reflect above and BOI.
5. Policy Execution with binding terms and conditions (subject to agreed-upon expiration of BOI and related TRAF and Premium Deposit requirements to keep BOI in effect).

PROCESS TIMELINE: 3-6 weeks
(from LOI to BOI and Policy Execution)

EVOLVING RISK LANDSCAPE

As the clean energy transition accelerates and the landscape transforms, emerging technologies and processes will most likely play an even larger role. The insurance industry is committing to support green investment and expansion. Technology Performance Insurance and other specialty risk transfer solutions are poised to grow.

RiskMap—Strategic Risk Assessment

To help clients better understand risk across the enterprise and through all stages of project development, Gallagher developed an industry specific RiskMap around “likelihood” and “organizational impact”. It’s a new assessment tool that includes our ESG client framework and is especially effective for clean energy.

The RiskMap helps organize and prioritize risk, and answer “what if’s” such as: The technology doesn’t work? IRS challenges tax credit qualification? Key customers default? Supply chain delays? Natural catastrophes (fire/hail)? Cyber attacks, etc. Below is a hypothetical developer/owner-operator.

Renewable Energy Developer/Owner-Operator						
RISK LIKELIHOOD	5-Certain					
	4-Likely				Competition-P Political Risk-I Intermittency-P Economic Downturn-P	
	3-Possible		Technology Implementation-P	Operational Planning-P Technology Changes-P Contracts With Contractors-P Supply Chain-P Employee Recruitments-P Infectious Disease-P Cyber Attack-I	Credit and Collections-P Raw Material Cost-U Facilities/Equipment Obsolescence-P Contract Review-U Contractors-P Vendor Management-P Regulatory Challenges-P Availability of Raw Materials-U	Tax Strategy and Tax Credits-P Disaster Preparedness-I Service Disruption-P Key Employee Retention-U Capital Availability-U Business Continuity-I
	2-Unlikely	Comprehensive Communication with Staff-P	IT Availability-P Crisis Communications-P Workforce Injuries-I Workplace Harassment-I International Employees and International Travel-I Media Relations/ Social Media-P	Internal Controls-P Physical Security-I Vehicle Accident-I Geological Events-I Offshore Activities-I Joint Ventures-U Records Management-P Compensation and Benefits-U Employee Wellbeing-P Marketing-U Board Performance and Retention-P Commitment to the Mission and Ethics-P IT Security-I	Decline in Demand-U Innovation-P Fire or Explosion-I Environmental-P Compliance Management-P Mergers & Acquisitions-P Transportation-I Adequate Staffing Levels-P Succession Planning-P Customer Relations-P Cash Management-P	Facilities/Equipment Maintenance-P Extreme Weather Events: Loss of Service or Damage to Facilities-I Extreme Weather Events: Remote Project Sites-I Debt Covenants-P Product/ Service Quality-P
	1-Rare	Employment Regulations-P	Facility Accessibility-P Workplace Violence-I Infectious Disease-P Intellectual Property Infringement-P Staff Retirement-P Negligent Hiring-P			
		1-Negligible	2-Minor	3-Medium	4-High	5-Extreme
ORGANIZATIONAL IMPACT						

Note: Risks are categorized as Insurable (I), Partially Insurable (P) and Uninsurable (U).

MANAGING KEY RISKS – INSURABILITY AND BEYOND

In this changing environment, many energy companies are incorporating proactive risk management strategies throughout all stages of project development. Given the evolving and complex risks among multiple parties, we encourage clients to identify and manage all their risks in advance and understand which ones can be transferred via insurance.

Clients use the RiskMap to fine-tune insurance programs and elevate the discussion of risk beyond the traditional definition, which has been focused on hazards and the adverse effects of accidental losses, to a higher level within the organization. A strategic approach to risk designed to build organizational resilience can also lead to greater innovation and agility in responding to opportunities as they emerge.