

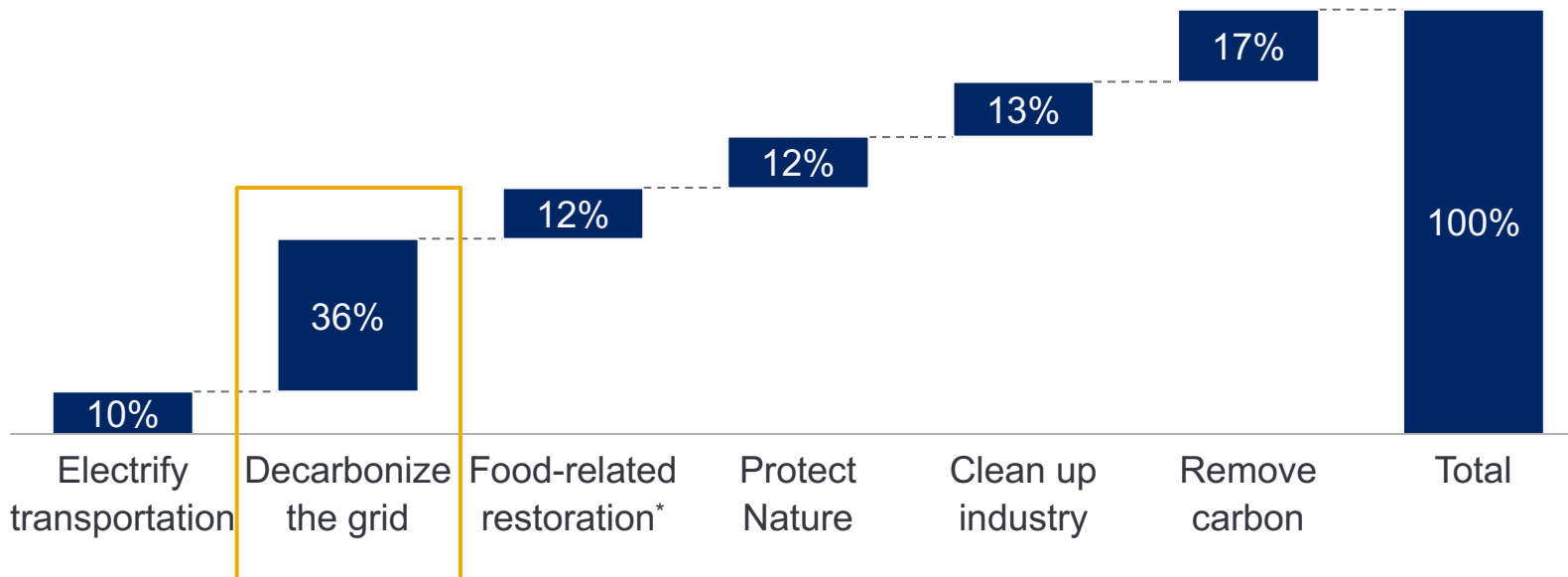
# Mitigating risks to low carbon investment and infrastructure – contingent capital flows, project insurability, and their limits

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# The global energy system is decarbonizing and will impact all segments of the economy

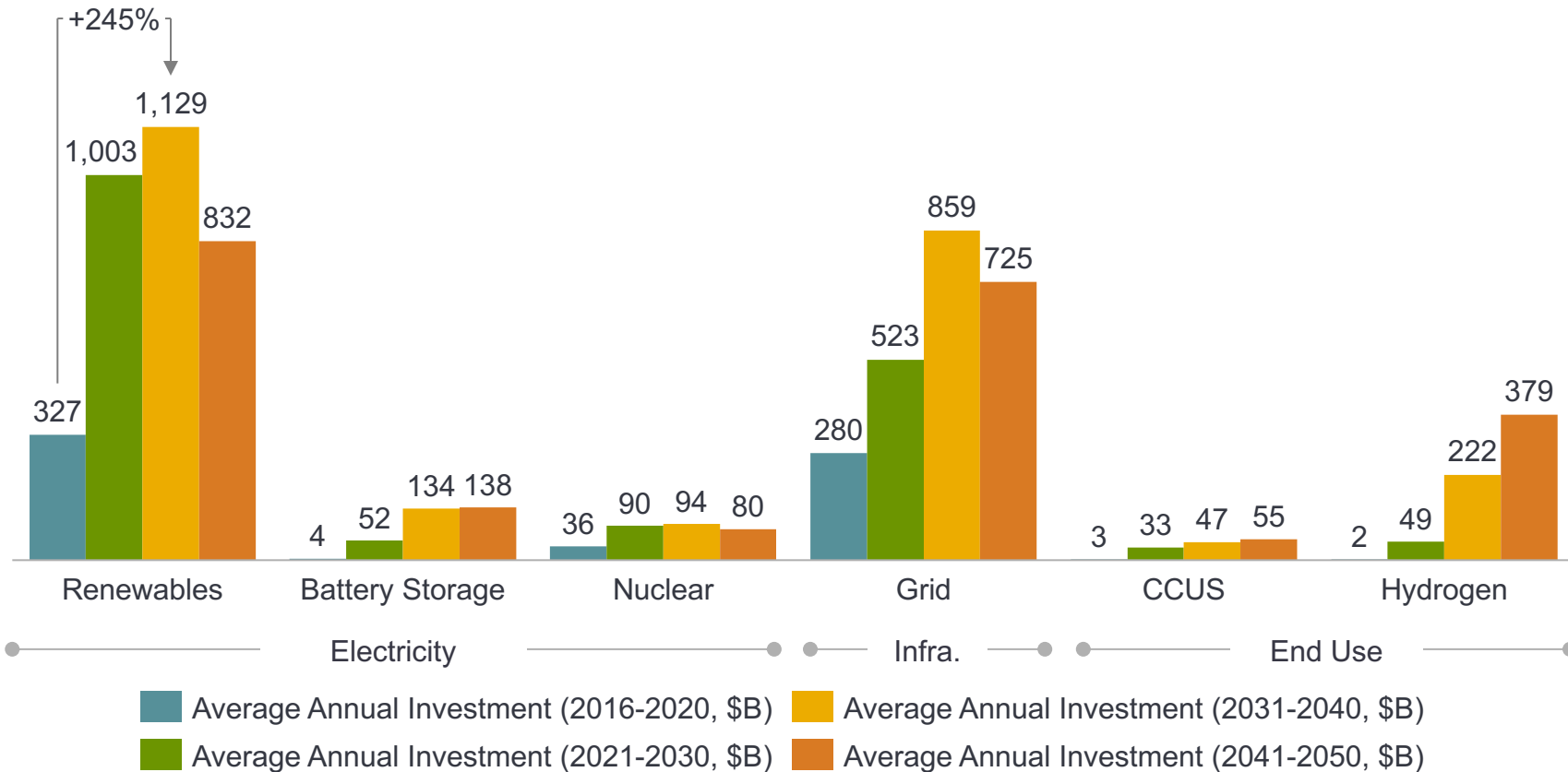
Paths to cut 59 gigatons/year of carbon emissions to reach net-zero by 2050



Today's focus is on decarbonizing the grid – energy generation and transmission – the opportunity with renewable energy and the implications for P&C insurance

# Renewables and low carbon projects are seen as a key growth area for the insurance market

Total annual investment by technology (\$B)



~\$120T of global investment required by 2050 to achieve "net zero"

We expect the following cumulative investments by 2050:

- Renewables: ~\$30T
- Hydrogen: ~\$6T
- Storage: ~\$3T
- CCUS: ~\$1T

Insurers are responding by developing their internal capabilities, refining their market approaches, and exploring new models

### Developing deeper insights

Risk engineering teams partnering with industry

Technology players sharing anonymized data & insights

Actuaries developing new pricing models

Underwriters developing tailored insurance products and policy forms

### Adjusting market approach

Refining underwriting appetites

Increasing capacity

Developing partnerships with brokers

### Creating new solutions

Lloyd's Catalogue of Innovation to fast-track innovative ideas

Facilities to streamline the process

Technology readiness assessments

Risk appraisal frameworks

# Low Carbon Infrastructure – Risk Summary

ID	Risk Type	Risk Description	Feasibility of Insurance
1	Build and test	Risk of property damage or possible Third party liability arising during the construction or testing of new technologies, plants / assets.	[+]
2	Business and strategic	Risk affecting the viability of the business, such as the risk of technological obsolescence, scale-up risk, lifecycle costs	[-]
3	Environmental	Risk of environmental (or ecological) damage caused by the installation and liability resulting from such damage – eg CO <sub>2</sub> leakage after geological sequestration, water resources damage for green hydrogen	[-]
4	Financial	The risk of insufficient access to, or high cost of capital	[-]
5	Market	The risk of an increase in the prices for materials and resources (e.g. critical minerals, energy supply prices) or uncertainty in long term pricing and market uptake / growth	[-] [+]
6	Operational	Risk of unplanned plant shutdown, eg due to unavailability of resources or feedstock, plant damage, machinery breakdown, or component failure including cyber threats.	[+] [-]
7	Political and Regulatory	Risk associated with changes in government policies, such as subsidies, tariffs such as carbon pricing that impact the profitability of the asset / portfolio	[-]
8	Weather / Resource Supply	Risk of reduced capacity due to capacity factor reductions caused by lower wind / sun intensity (parametrics insurance)	[+]
9	NatCat	Extreme weather events – e.g storm, flood, hail damage.	[+]

# Risk Categorization for Low Carbon Infrastructure

Category	Construction All Risk CAR/EAR	Resource Supply	Property Damage	Machinery Breakdown	Business Interruption	Delay in Start-up / ALOP	Technology Risk / Defects	EPC Contractor Overall Risk	General Third Party Liability
Onshore Wind	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green
Offshore Wind	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Yellow	Green
Solar PV	Green	Yellow	Yellow	N/A	Green	Yellow	Yellow	Green	Yellow
Wave/Tidal	Green	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow
Geothermal	Green	Yellow	Green	Green	Yellow	Yellow	Grey	Green	Green
Biogas	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green
LDES*	Green	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green
Green Hydrogen	Grey	Grey	Yellow	Yellow	Grey	Yellow	Grey	Yellow	Yellow
CCUS / Blue Hydrogen	Yellow	Yellow	Yellow	Yellow	Grey	Yellow	Yellow	Yellow	Grey

Increasingly comprehensive and competitive insurance cover

Partial cover – some gaps in cover, limited capacity, high premiums / deductibles

Limited cover available – restrictive terms and conditions, many exclusions

No or very limited cover available from insurance markets

# Sustainable Markets Initiative – Insurance Task Force: Selected product & service innovations

## Solar energy insurance

- Solar energy industry covers designed to protect both manufacturers as well as owners and investors against the failure or underperformance of photovoltaic panels and other key components of solar parks.
- As an additional layer of protection, can also safeguard projects against the scenario that the manufacturer's warranty cannot be called upon due to the insolvency.
- Developing other insurance products such as a cover for the actual yield of solar parks.

## Equity contribution guarantee syndicated facility

- Equity contribution guarantee (ECG) syndicated facility provides bespoke protection to support renewable energy clients.
- It is a trade finance facility which supports guarantee requirements on renewable energy projects.
- Using a surety, insurers provide monetary compensation to the beneficiary in the event the principal fails to perform its contractual or commercial obligations.
- A counterindemnity is taken from the principal (and potentially its parent company) allowing the surety to seek reimbursement in the event the surety has to pay a claim under the surety bond.

## Renewable energy project tax credits

- Coverage for tax credits for investments in eligible renewable energy projects. Such credits include:
- 1) Investment Tax Credits ("ITC") which are designed to partially compensate taxpayers for the cost of installing renewable energy systems;
- 2) Production Tax Credits ("PTC") which are per kilowatt-hour (kWh) tax credits for electricity generated by qualified renewable energy resources;
- 3) Sequestration Tax Credits ("45Q"), which are available to taxpayers that capture and store, or use carbon dioxide and carbon oxide. Market offers 7-year to 10-year coverage for such policies.



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