

Advancing Natural Infrastructure Forum in Canada

Natural Infrastructure Financing

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- Established in 1880
- Global reach, 30 countries -> 42,000 employees
- Reinsurance: €31.6bn premium income
- Insurance: €19.0bn premium income
- Asset Management: €217.6bn in worldwide assets

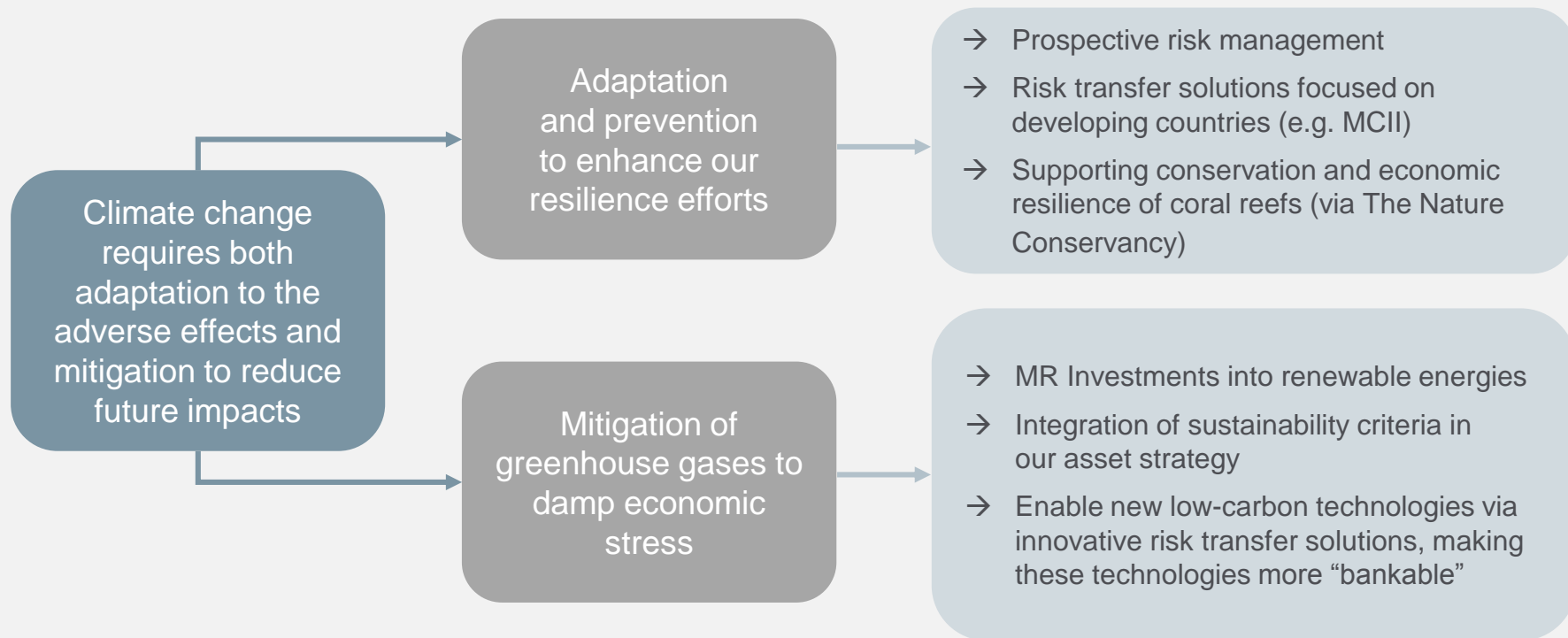
- Insurance for insurance companies
- Insurance companies method of protecting themselves against too great a loss from their operations
- Reinsurance transaction is an **agreement** between **two or more parties**, the **reinsured or ceding company** and **reinsurer**
- The reinsurer **agrees to accept** a certain **fixed share of the reinsured's risk** upon **terms as set out in the agreement**.



Munich Re Geo Risks Expertise

- Munich Re established a natural hazards department in 1974
 - ✓ we have more than 40 years of research
- More than 25 experienced geoscience experts analyse and evaluate the full spectrum of natural hazards





Munich Re risk transfer solutions for renewable energies and new technologies

Munich Re provides insurance solutions along the value chain of renewable energies and new technologies. Some cover examples:



Solar

- Performance Guarantee for PV manufacturers
- PV-Option cover for operators
- PV-Project cover for investors
- Performance Guarantee for CSP manufacturers
- CSP-Delay and Output cover for EPC contractors



Wind

- Serial loss cover for manufacturers and suppliers
- Offshore logistic delay cover
- Maintenance cost overrun



Solar/Wind/Water

- Coverage of shortage of planned output in running a power plant due to insufficiency of average sunlight / wind / water



Geothermal

- Cover for Drilling success / exploration risk

Risk = the possibility of financial loss

Traditionally, replacement of what was lost.

“Indemnity Basis”



Image: Thinkstock



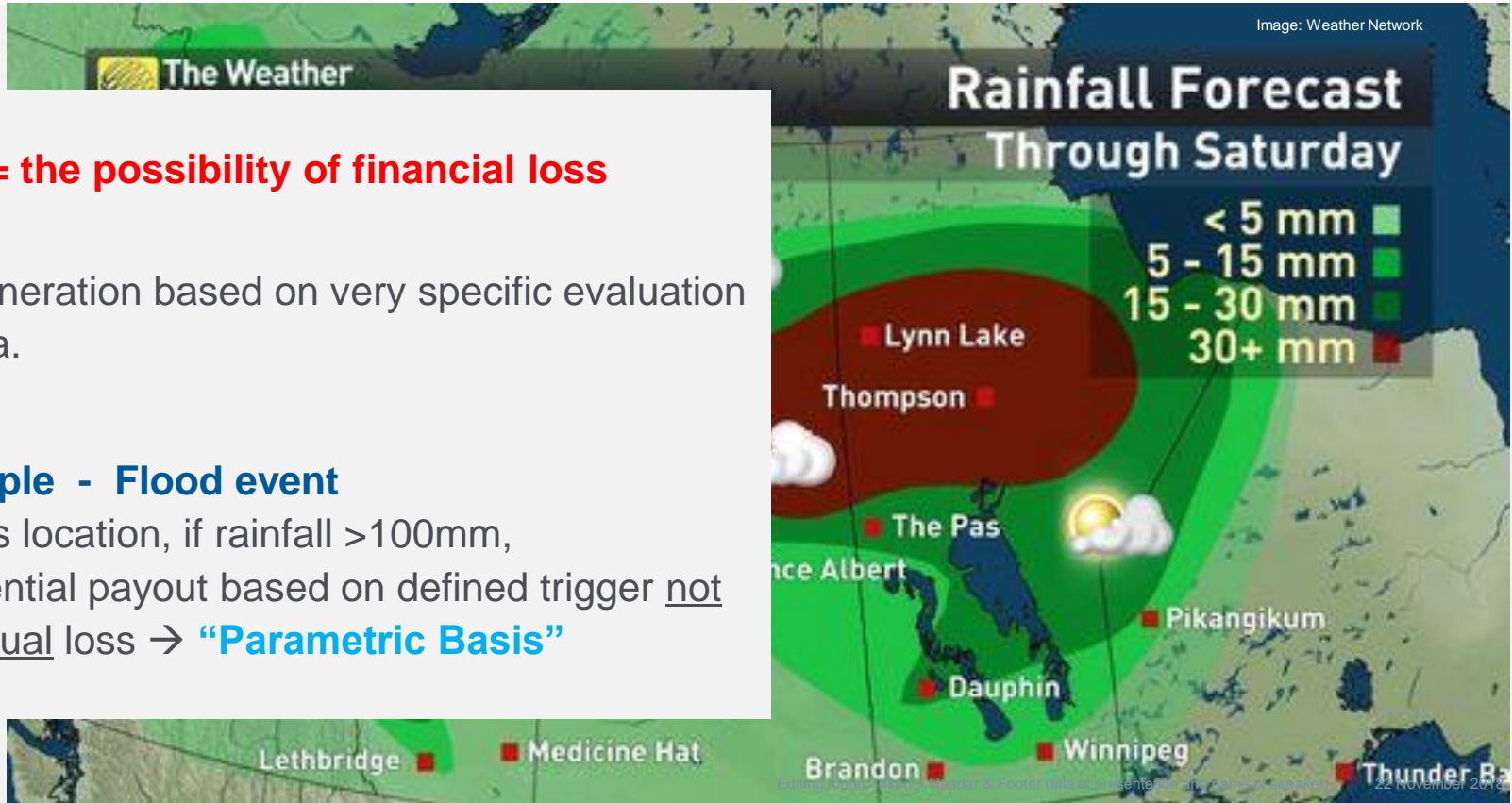
Image: Thinkstock

Risk = the possibility of financial loss

Remuneration based on very specific evaluation criteria.

Example - Flood event

for this location, if rainfall >100mm,
= potential payout based on defined trigger not
on actual loss → **“Parametric Basis”**



Resilience Bond

- Based on a catastrophe bond
 - ✓ Trigger based payout (parametric)
- Explicitly incorporate the risk reduction value of a specific resilience project
- Two step process
 - ✓ Issuer uses models to validate if and how much a resilience project reduces expected losses. This sets the value of the resilience rebate from the reduced cost of coupon payments to investors.
 - ✓ These cost savings are then passed on to the bond sponsors which can be used to finance risk reduction investments.

Environmental Impact Bond (EIB) – Example: Washington, DC

- Reducing incidence and volume of combined sewer overflows
- Performance risk shared amongst DC Water and the investors (“pay for success”)
- Additional payment of \$ 3.3m in case of significant under/-over performance after 5 years
- 30-year tax exempt municipal bond, proceed from EIB provide up front capital needed
- \$25 million, mandatory tender after 5 years
- Final report will be reviewed by “independent validator”

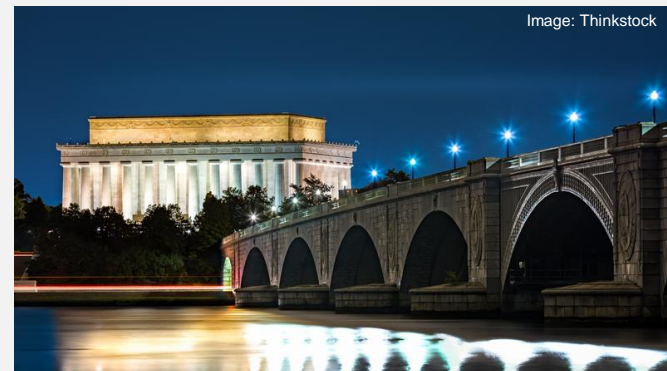
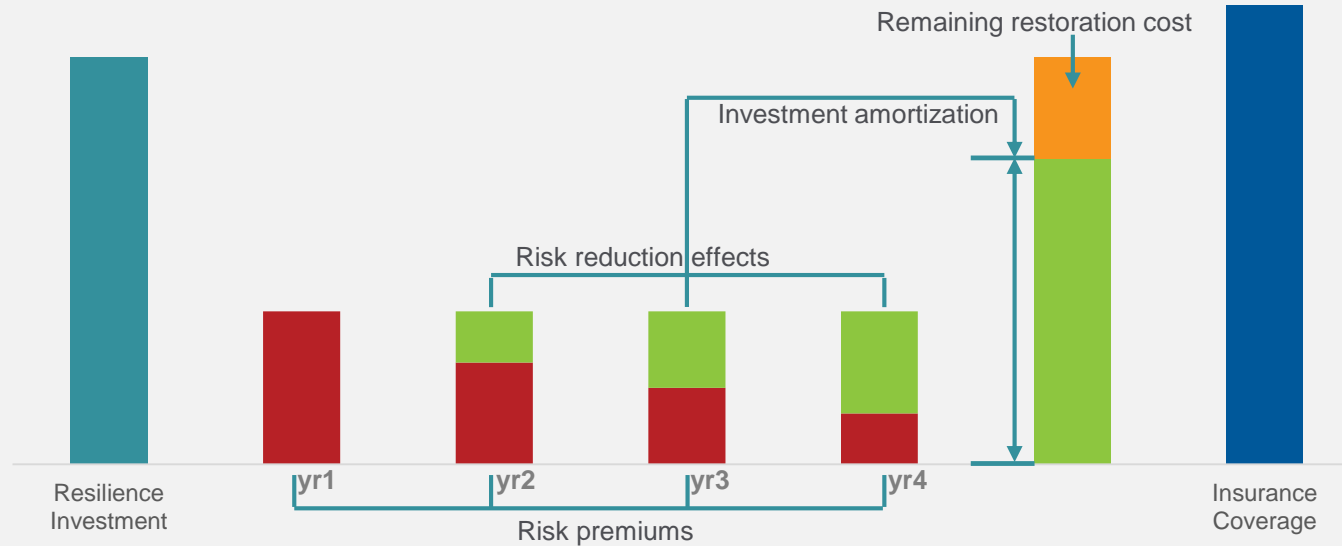


Image: Thinkstock

Atlanta is considering a similar bond allowing city residents to invest in improving their city.

Risk Reduction and Risk Transfer coupled in one solution



- Investment in risk reducing measures and risk transfer combined
- Resilient investment reduces underlying risk
- Risk-mitigating impact is monetized over the time period via reduced premiums
- Incentive both for risk-reducing infrastructure and risk transfer resulting in increased community resilience