

# Precipitation protection

Innovative weather risk transfer solutions for all industry sectors

Munich Re is a market leader in the modelling, pricing and trading of weather derivatives. These market-based **bespoke solutions** compensate for our clients' weather-related losses if the realised weather outcome falls outside an established range.

### Your challenge

- Your **business performance** is negatively impacted by low precipitation
- You would like to **protect your hydropower assets** against low water inflows which impact hydropower production

### Use case

- Your power utility is located in Iberia
- Due to low precipitation, the expected **inflows are lower than expected**
- This results in **lower revenues** for your hydropower assets
- A **put option** to protect against low inflow is considered

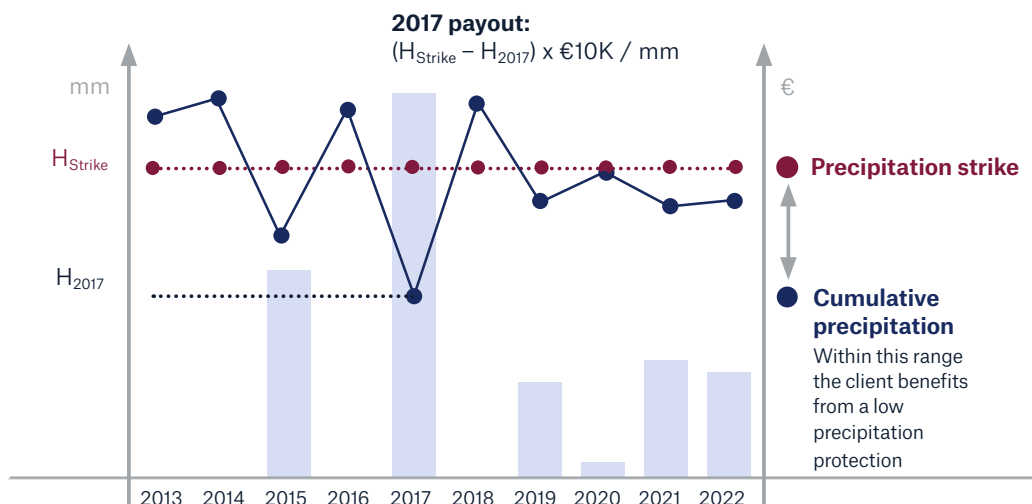
### Solution

- A suitable **weather index** is chosen to best approximate the actual inflows
- A **derivative structure** is designed to progressively pay as precipitation falls below the trigger level, referred to as the strike

## Example of product definition and associated performance

### Put on low precipitation





- Index**  
Cumulative precipitation
- Strike**  
600 mm
- Risk**  
Too low
- Location**  
Basket of weather stations in Iberia
- Risk period**  
Annual (Jan - Dec)
- Notional**  
€10K / mm
- Premium**  
On request



When the index falls below the strike, the client receives a payout. The level of the payout is equal to the difference between the strike and the index, multiplied by the agreed notional.


## We offer a range of bespoke weather-contingent risk management solutions

### 1 Weather perils

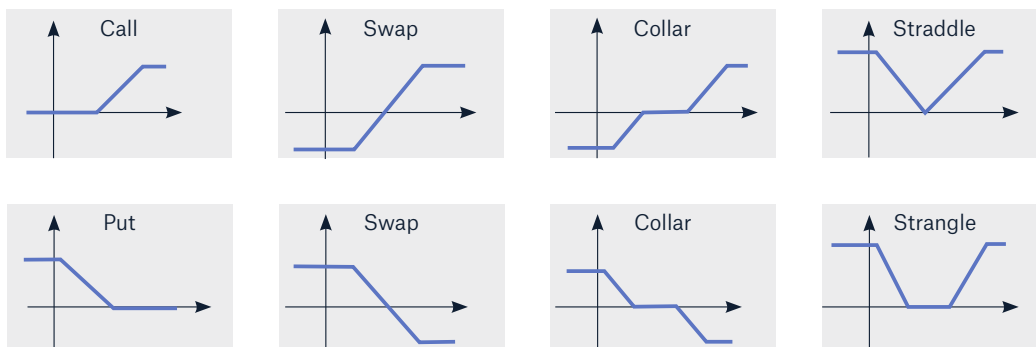
<p><b>Wind</b></p> <ul style="list-style-type: none"> <li>- Wind speed</li> <li>- Wind power generation</li> <li>- Wind direction</li> </ul>		<p><b>Solar</b></p> <ul style="list-style-type: none"> <li>- Hours of sun</li> <li>- Solar irradiation</li> <li>- Solar power generation</li> </ul>		<p><b>Temperature</b></p> <ul style="list-style-type: none"> <li>- Avg. / Min. / Max. temperatures</li> <li>- Heating or Cooling Degree Days (HDD, CDD)</li> <li>- Sigmoid function for energy demand</li> </ul>		<p><b>Water</b></p> <ul style="list-style-type: none"> <li>- River height</li> <li>- Streamflow</li> <li>- Water power generation</li> </ul>	
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**Other**  
Contact us about any weather-related risk you are exposed to.

### 2 Where

<p><b>Global coverage</b></p> <ul style="list-style-type: none"> <li>- Weather stations</li> <li>- Lat./Long. coordinates</li> </ul>	<ul style="list-style-type: none"> <li>- Speedwell indices</li> <li>- Third-party data feeds</li> </ul>	
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### 3 Select and customise the structure suitable for your business



## Contact



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