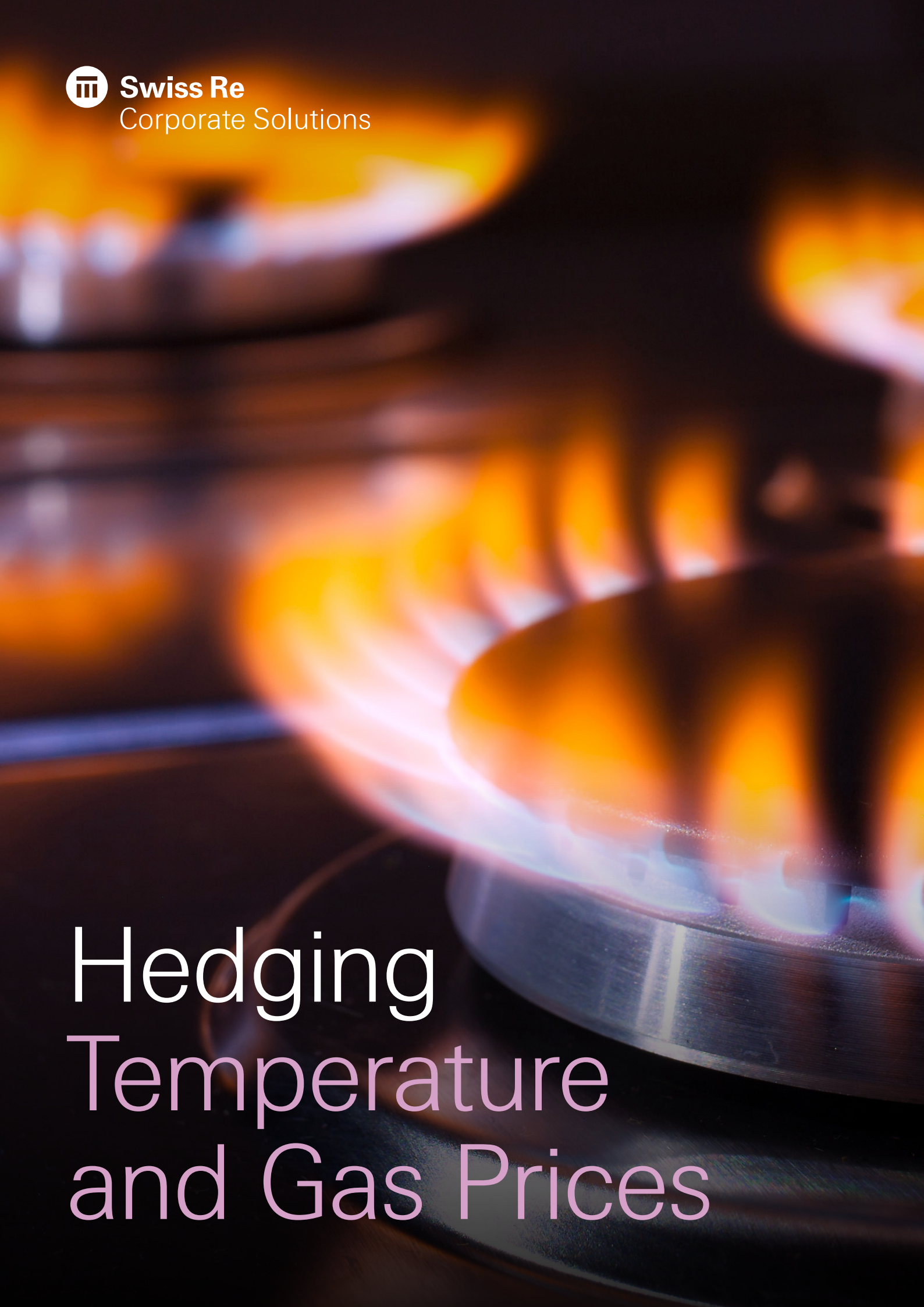
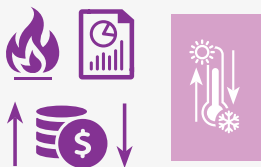




Hedging Temperature and Gas Prices



Exposure and application



**Gas retailers
face both
temperature
and commodity
price risk:**

temperature
drives demand
and gas prices
drive margins



**Since
temperature is
unpredictable,**
risk managers
must guess when
they put price
hedging in place
– most hedge to
a normal level
of demand



**Even modest
fluctuations**
around those
“normal” volumes
play havoc with
gas price hedges



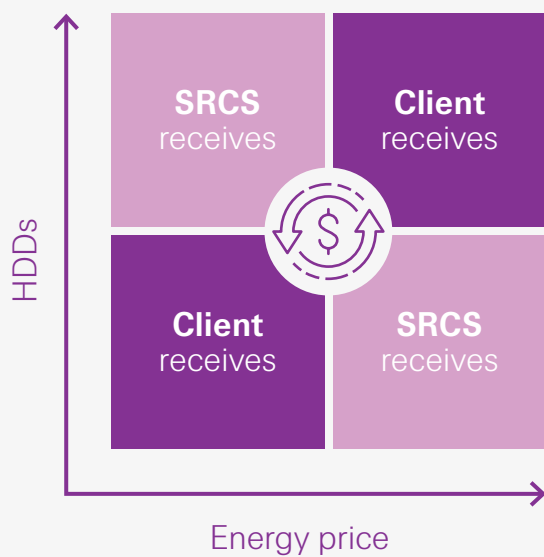
**Financial
index products
compete very
effectively**
with other ways
to manage
this risk (active
delta hedging,
storage, flex in
gas contracts)



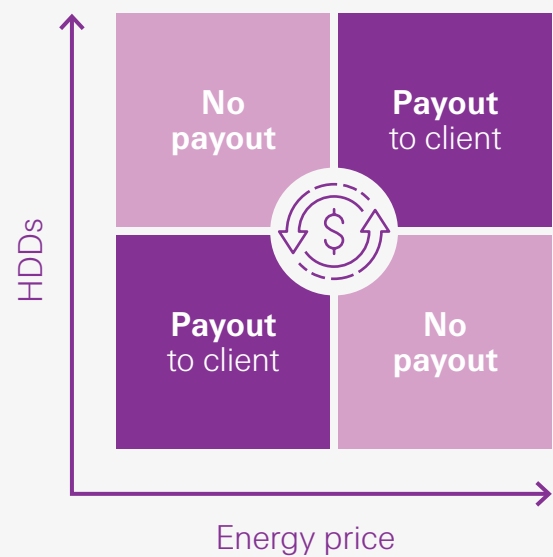
Structure



Swap payout mechanics



Option payout mechanics





Notional terms



Product	Temperature / gas swap
Location	London Heathrow Airport (LHR)
Index	Heating Degree Days (HDDs): Difference between a day's average temperature and 18, if negative. Examples: If average temperature is superior or equal to 18° C, then HDD count for that day is 0. If average temperature is 11, then HDD count for that day is 7. Gas index (Price) = NBP day-ahead price
Strike	Set by client according to hedging strategy
Payout	$\text{MDaily Payout} = (\text{HDDActual} - \text{HDDStrike}) \times (\text{PriceActual} - \text{PriceStrike}) \times \text{Notional Volume}$
Tick or notional	Can be fixed or shaped by gas demand
Term	November to March



Case study



Client	UK household gas retail cooperative
Problem	Delta hedging strategy was not effective in smoothing margins, and carried high transaction costs
Solution	Gas/temperature swap to offset variability in underlying operating profits
Location	12 locations weighted to match load and service area
Result	Operating profits were protected, giving business unit much more earnings stability

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