

# Electricity Market Training Course

## CPPA-G

### DAY 2

**Your Commodities Risk Management Partner**

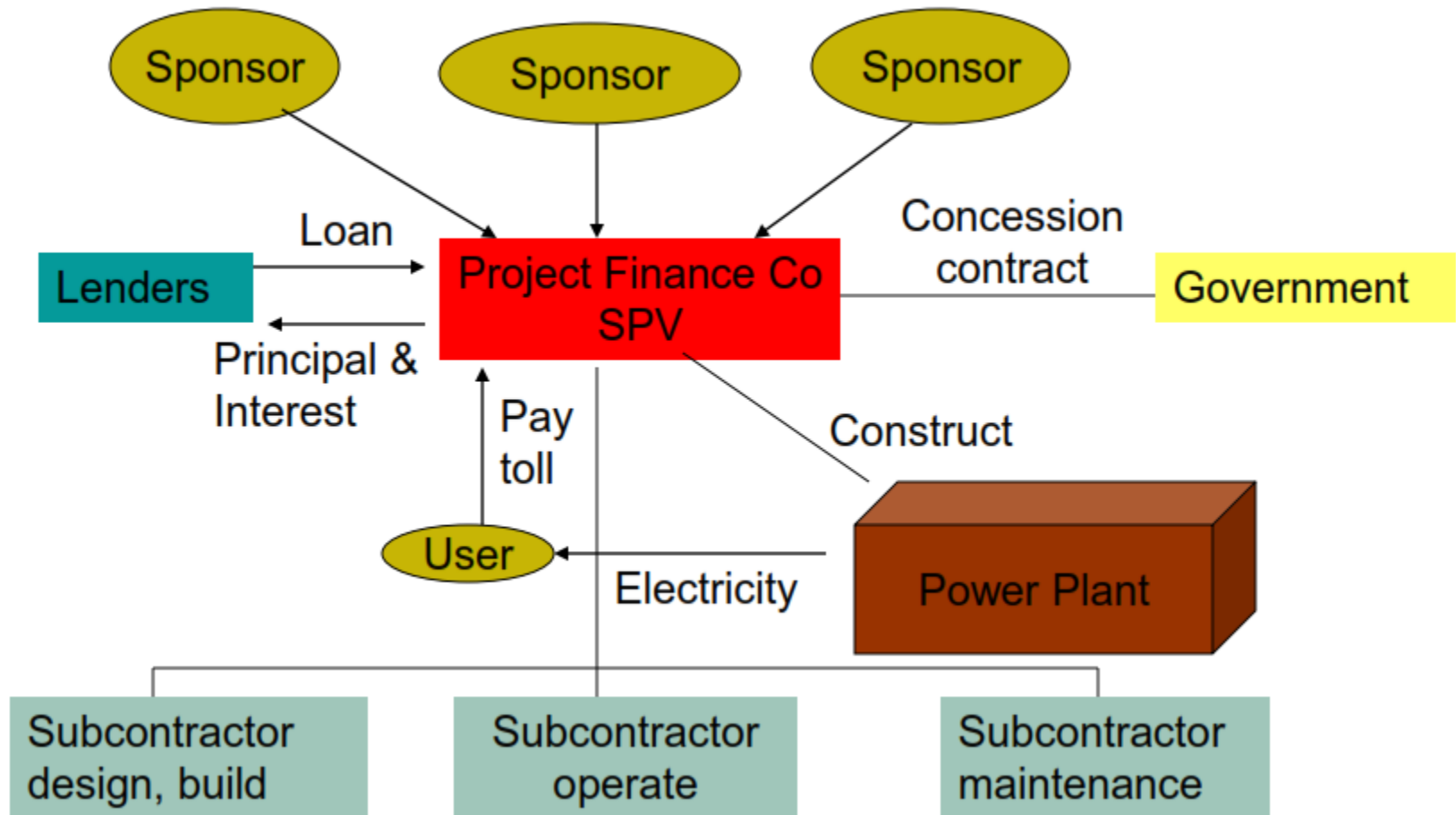
Benefit from **25 years** of experience in the commodity industry

**Kasper Walet**

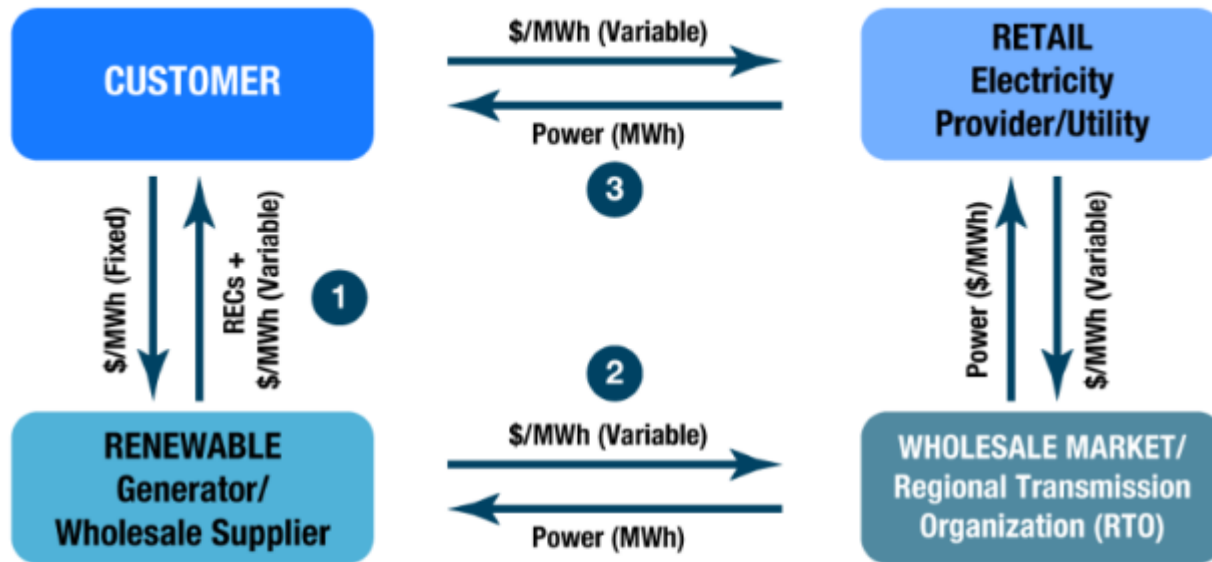
[walet@maycroft.com](mailto:walet@maycroft.com)

# Basic Types Power Sales Agreements

# Tolling



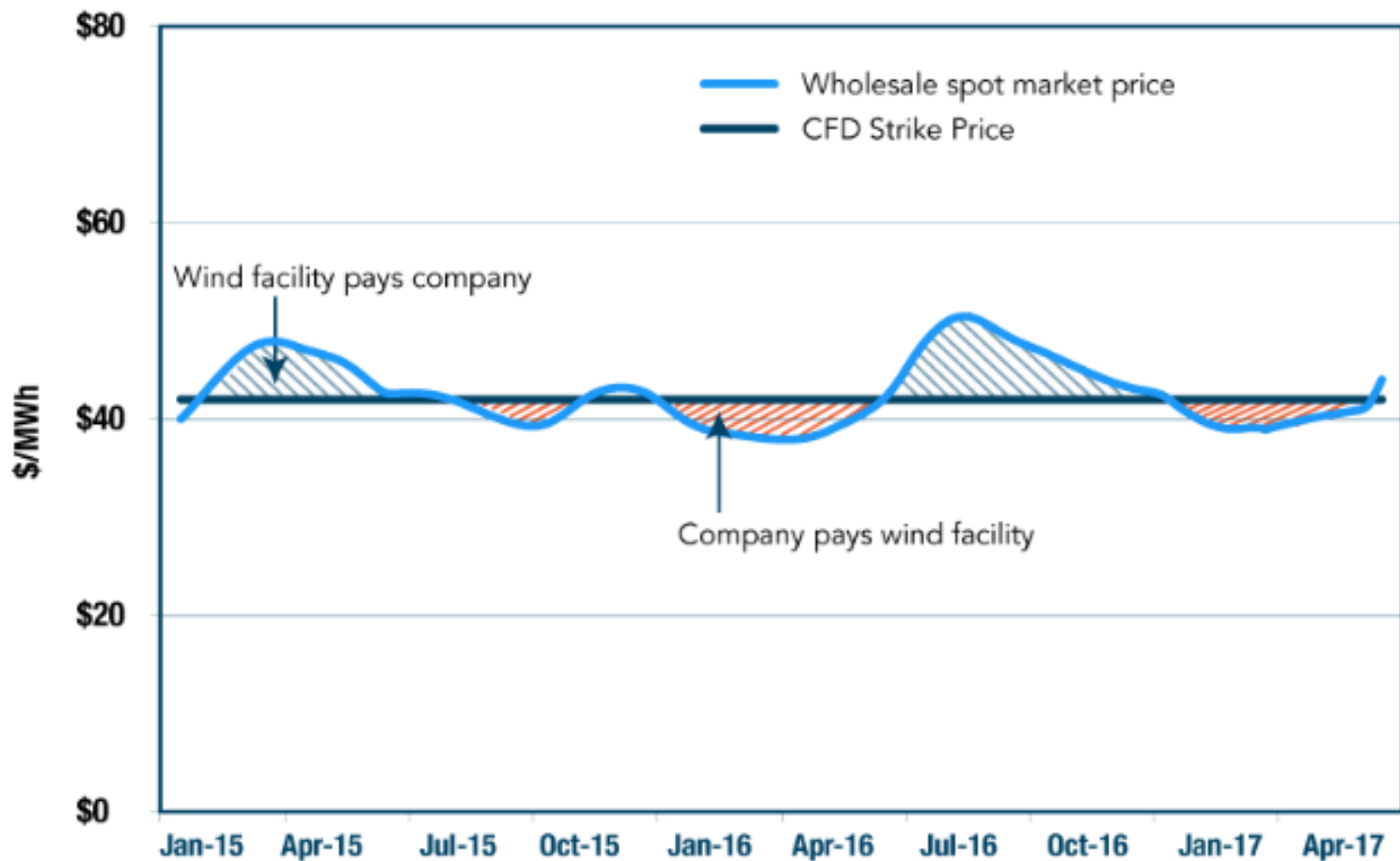
# Contract for Differences



## BUYING GREEN POWER: CONTRACT FOR DIFFERENCES

- 1** Customer signs Contract for Differences (CFD) with Renewable Generator at fixed rate (the "strike" price) for power. Generator delivers RECs plus variable settlement to Customer.
- 2** Renewable Generator sells power to Wholesale Market at "spot" price and settles with Customer based on difference between "strike" and "spot" prices.
- 3** Customer uses RECs and CFD settlement to offset carbon emissions and costs of retail power.

# Contract for Differences



# PPA 101

## Key points

### PPA 101

- The PPA grants the concession and sets the tariff. It is the primary document that the SBO would focus on. To some extent all the others are secondary

<b>Grants the concession</b>	<ul style="list-style-type: none"> <li>• Grants the concession - gives the project the right to exist, and the right to generate electricity. Term typically 20-25 years from completion of construction</li> </ul>	
<b>Ownership</b>	<ul style="list-style-type: none"> <li>• BOO or BOT</li> </ul>	
<b>Sale and purchase of capacity</b>	<ul style="list-style-type: none"> <li>• Generator (IPP) paid on the availability of net dependable power capacity irrespective of despatch sufficient to cover debt service, equity return and fixed O&amp;M</li> </ul>	<ul style="list-style-type: none"> <li>• Procurer (SBO) takes price and despatch risk</li> <li>• Take or Pay</li> </ul>
<b>Sale and purchase of Net Electricals</b>	<ul style="list-style-type: none"> <li>• Variable O&amp;M costs recovered through the sale of the net electrical energy dispatched</li> </ul>	
<b>Indexation</b>	<ul style="list-style-type: none"> <li>• Tariff payments may be indexed for inflation and movements in Foreign Exchange rates</li> </ul>	<ul style="list-style-type: none"> <li>• Procurer may take inflation and forex movements risk</li> </ul>

- The responsibilities will be split

## Performance criteria

<b>Specifications and Performance Standards of the Plant</b>	<ul style="list-style-type: none"> <li>• PPA sets out the responsibility of the Generator to build by a given date a plant to very precisely documented specifications, operating standards and designs</li> </ul>	<ul style="list-style-type: none"> <li>• Generator / EPC Contractor takes the responsibility and risk of building the plant to the requirements of the Procurer</li> </ul>
<b>Revenue Write Down provisions for non-Performance</b>	<ul style="list-style-type: none"> <li>• PPA includes provisions to reduce the payments payable to the Generator if the tested dependable capacity at any time or the actual availability [or the heat rate] is worse than the levels the Generator is contracted to provide</li> </ul>	<ul style="list-style-type: none"> <li>• Generator takes performance risk</li> </ul>
<b>Delay LD's for late commissioning</b>	<ul style="list-style-type: none"> <li>• Delay LDs payable for late commissioning payable by Generator/ EPC Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Generator takes risk of late commissioning</li> </ul>

# PPA 101 (Contd...)

## Key points

## PPA 101 (Contd...)

- The responsibilities will be split (Contd...)

### Third party responsibilities

<b>Water and Power Transmission interconnections</b>	<ul style="list-style-type: none"> <li>• Generator would seek to make it an obligations of the Procurer to design build and commission all required water and transmission linkages by an agreed date and prior to scheduled testing</li> </ul>	<ul style="list-style-type: none"> <li>• Procurer takes responsibility for providing Water and Power Interconnections</li> <li>• The PPA sets out provisions for the Procurer to keep the Generator whole and / or pay compensation if such facilities are late</li> </ul>
<b>Supply of Gas / Coal / Fuel</b>	<ul style="list-style-type: none"> <li>• In many markets, the Generator would seek to make it an obligation of the Procurer to supply Gas / Coal / Fuel (ie energy conversion)</li> <li>• Generator may take fuel / hydrology risk</li> </ul>	<ul style="list-style-type: none"> <li>• Procurer takes risk of fuel supply and pays deemed commissioning if fuel is not available Generator takes efficiency risk through an incentive penalty regime</li> </ul>
<b>Permits</b>	<ul style="list-style-type: none"> <li>• PPA allocates responsibility for obtaining permits</li> </ul>	<ul style="list-style-type: none"> <li>• Split between Procurer and Generator</li> </ul>

### Force majeure / political events

<b>Natural Force Majeure</b>	<ul style="list-style-type: none"> <li>• PPA sets out provisions in relation to relief of liability and the provision of insurance (both damage and business interruption) to mitigate Natural Force Majeure Risk</li> <li>• (Lightening, fire, earthquake, accidents, explosions, epidemics etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Insurance</li> </ul>
<b>Political Force Majeure</b>	<ul style="list-style-type: none"> <li>• There are certain risks which are uninsurable, political in nature and which Generators will not accept and need to be taken by the Procurer</li> <li>• (Act of war, blockade, boycott, rebellion, civil commotion, Change in Law and / or unjustified failure to renew permits)</li> </ul>	<ul style="list-style-type: none"> <li>• Procurer Risk</li> <li>• Payments of deemed commissioning [or termination buyout if prolonged] or tariff adjustments to compensate for additional costs or revenue losses</li> </ul>

# Corporate PPA

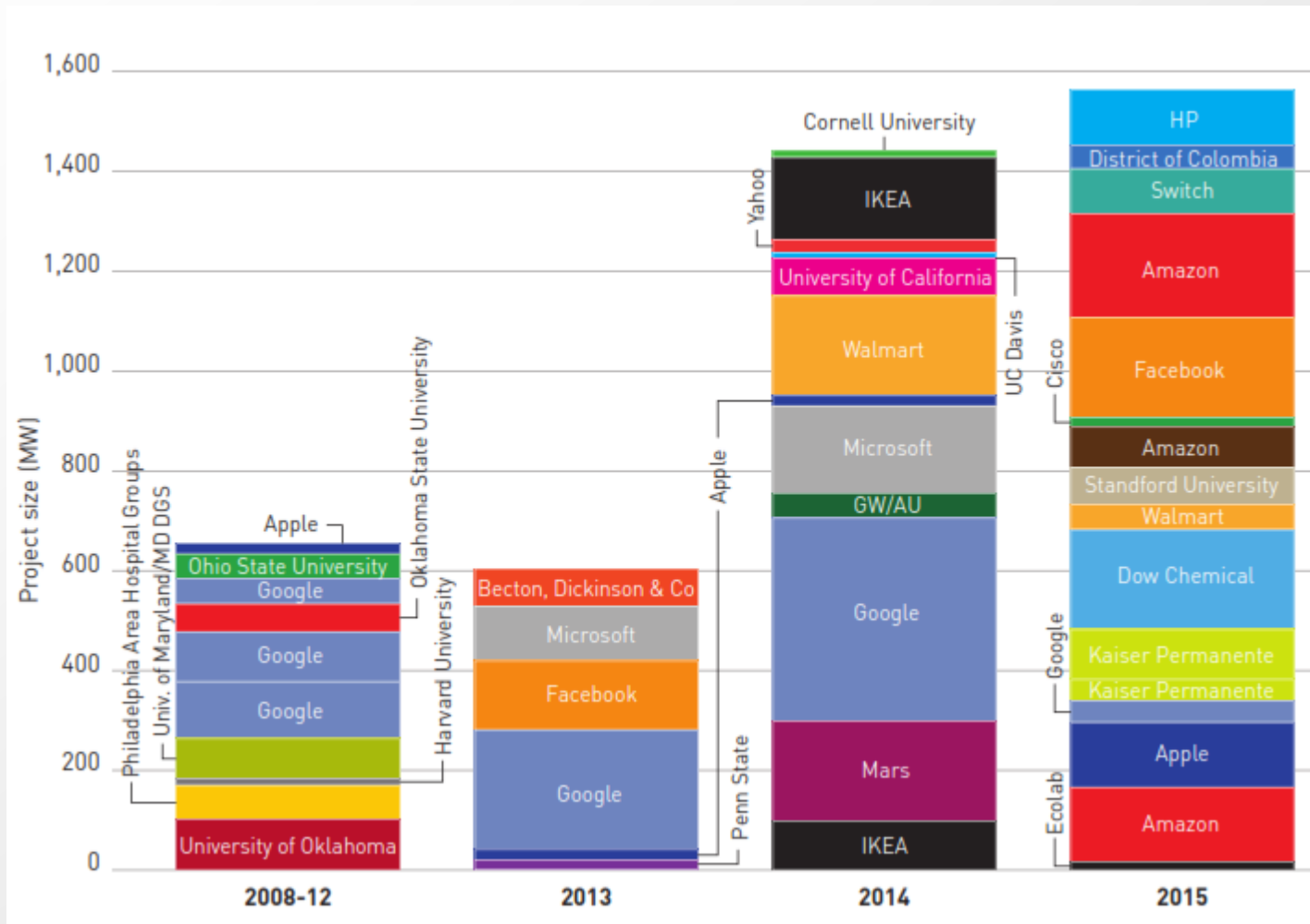
<b>Multinational retailer</b> <ul style="list-style-type: none"> <li>• Achieved cost savings</li> <li>• Improved public image</li> <li>• Improved customer satisfaction</li> </ul>	<b>Large internet company A</b> <ul style="list-style-type: none"> <li>• Delivered stable, predictable energy costs not subject to fossil fuel commodity price risk</li> <li>• Improved reputation among customers and peers</li> <li>• Improved support from local constituencies</li> </ul>
<b>Large internet company B</b> <ul style="list-style-type: none"> <li>• Increased profitability</li> <li>• Fuel price hedge</li> <li>• Reduced reputational risk</li> <li>• Demonstrated environmental leadership</li> <li>• Simplified GHG reduction program by aggregating efforts into one large project</li> </ul>	<b>Major consumer goods company</b> <ul style="list-style-type: none"> <li>• Achieved cost savings</li> <li>• Made major progress towards sustainability goals</li> <li>• Improved reputation among customers and NGOs</li> <li>• Raised employee morale</li> </ul>
<b>Global technology company</b> <ul style="list-style-type: none"> <li>• Raised internal awareness of energy and sustainability efforts</li> <li>• Improved external awareness, adding value to brand</li> <li>• Achieved cost savings</li> </ul>	<b>Major healthcare provider</b> <ul style="list-style-type: none"> <li>• Improved health of the community by reducing fossil fuel generation</li> <li>• Aligned operations with mission</li> <li>• Increased renewable energy generation without increasing expected costs</li> </ul>



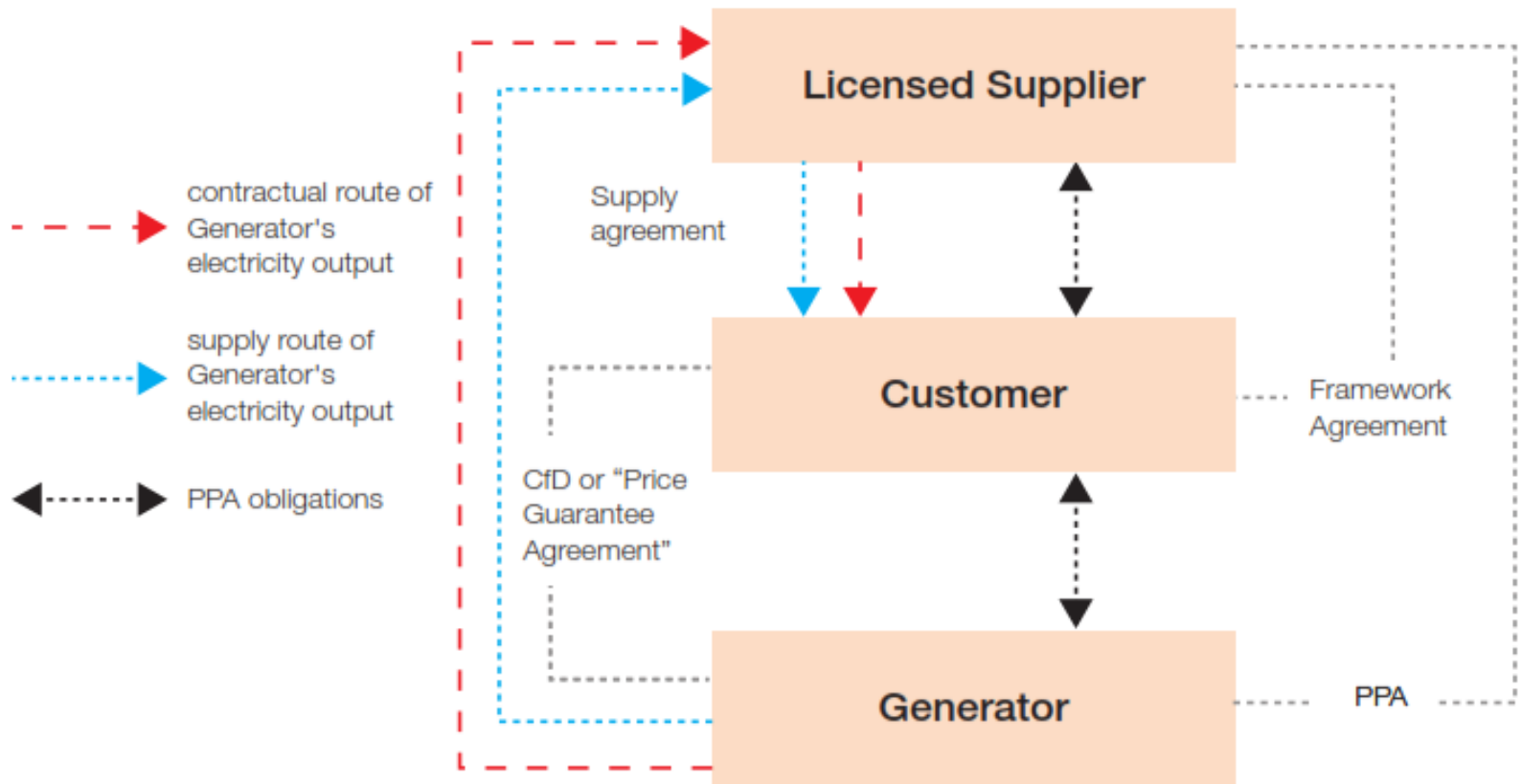
# Why Long Term Corporate PPAs?

Benefits	Description	Multinational retailer	Large internet company A	Large internet Company B	Major consumer goods company	Global technology company	Major healthcare provider
Financial	<ul style="list-style-type: none"> <li>Achieved cost savings</li> <li>Delivered stable, predictable energy costs</li> <li>Increased renewable energy sourcing at no cost increase</li> </ul>	✓	✓	✓	✓	✓	✓
Reputational	<ul style="list-style-type: none"> <li>Reduced reputational risk</li> <li>Improved public image</li> <li>Improved customer satisfaction</li> <li>Improved support from local constituencies</li> <li>Demonstrated environmental leadership</li> </ul>	✓	✓	✓	✓	✓	
Environmental	<ul style="list-style-type: none"> <li>Improved health of the community</li> </ul>						✓
Internal	<ul style="list-style-type: none"> <li>Raised employee morale</li> <li>Aligned operations with mission</li> <li>Raised internal awareness of sustainability efforts</li> <li>Made major progress towards sustainability goals</li> </ul>			✓	✓	✓	✓

# Why Long Term Corporate PPAs?

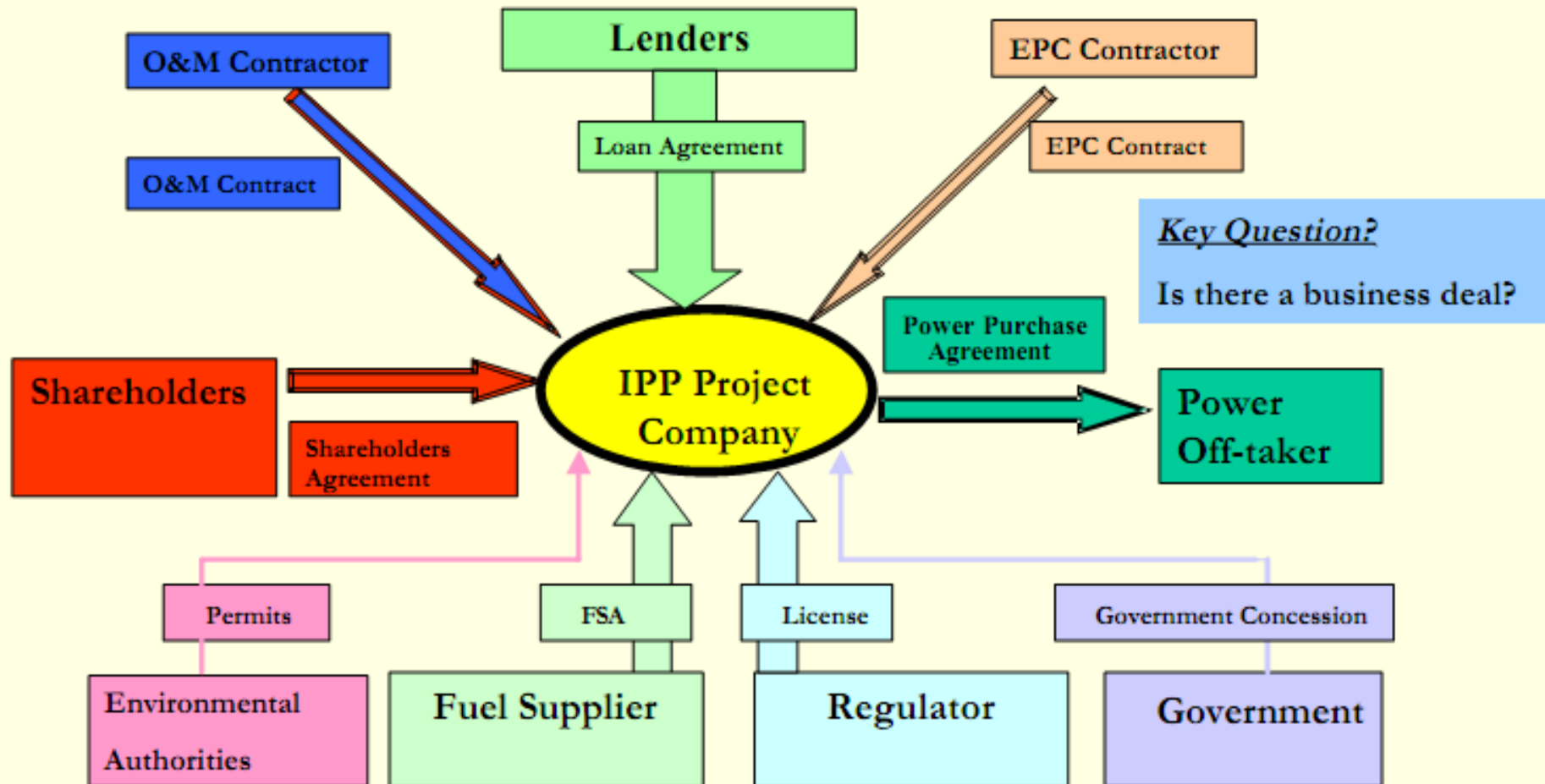


# CfD PPA structure

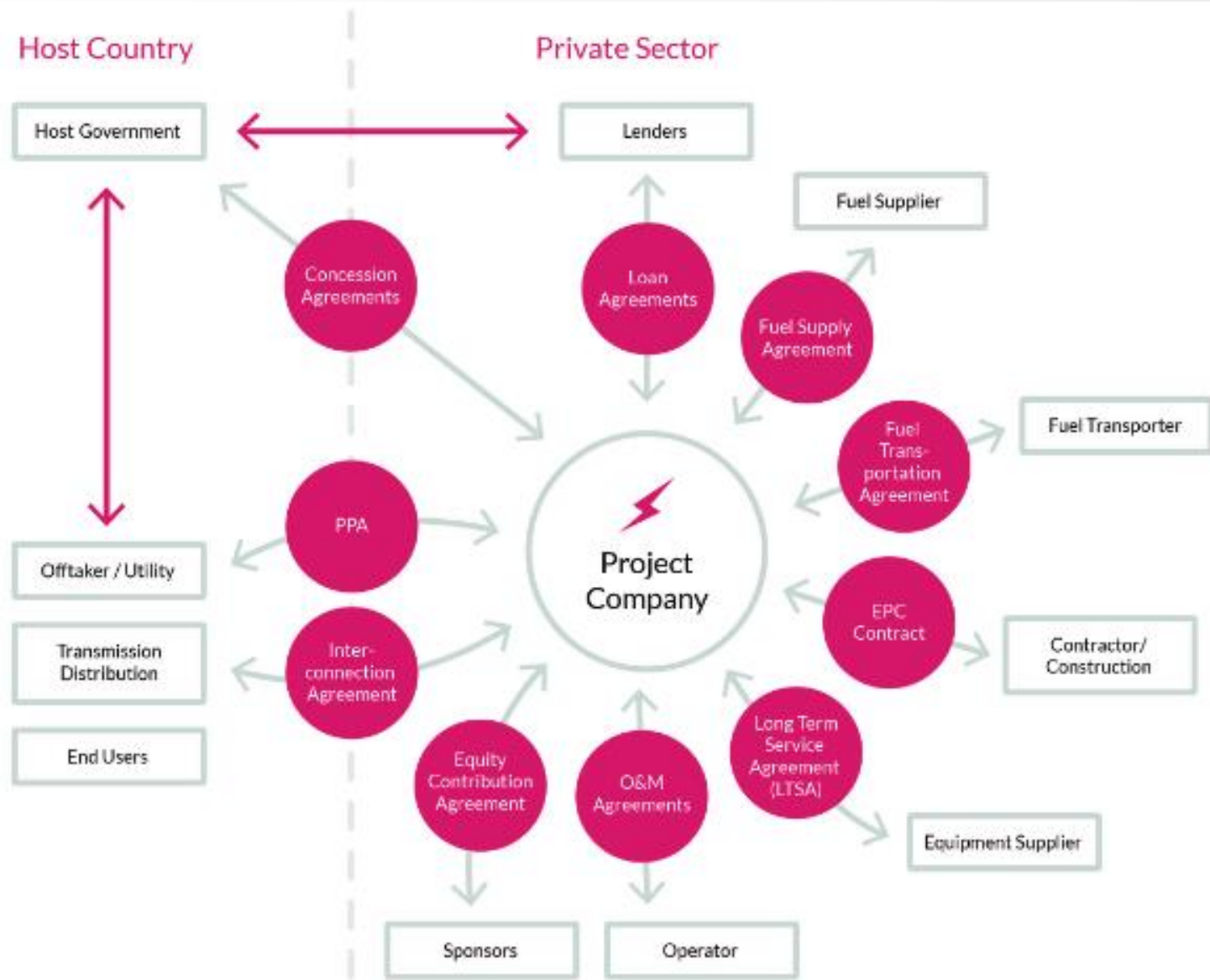


# Structuring IPPs and role of PPA

# Typical IPP Structure



# PPA and IPPs



# PPA Risk Assessment

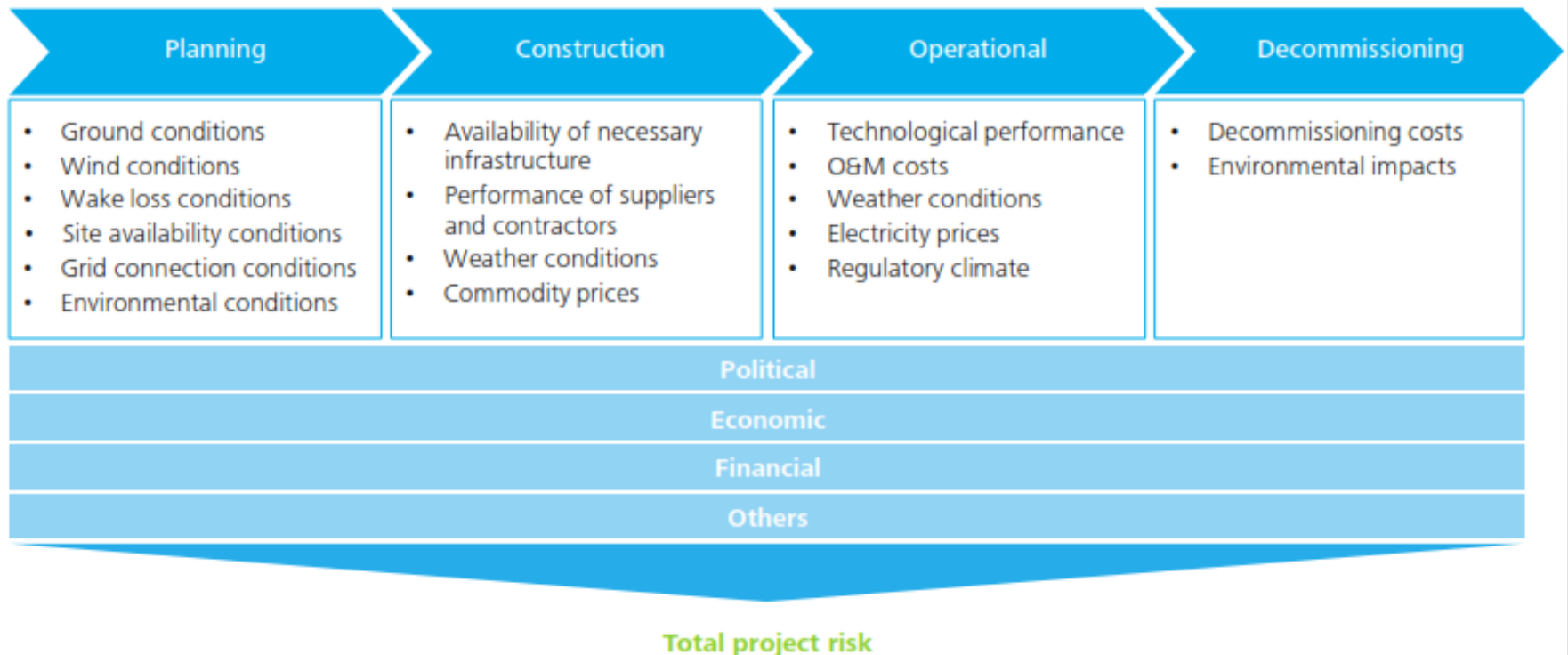


# Risks to be addressed

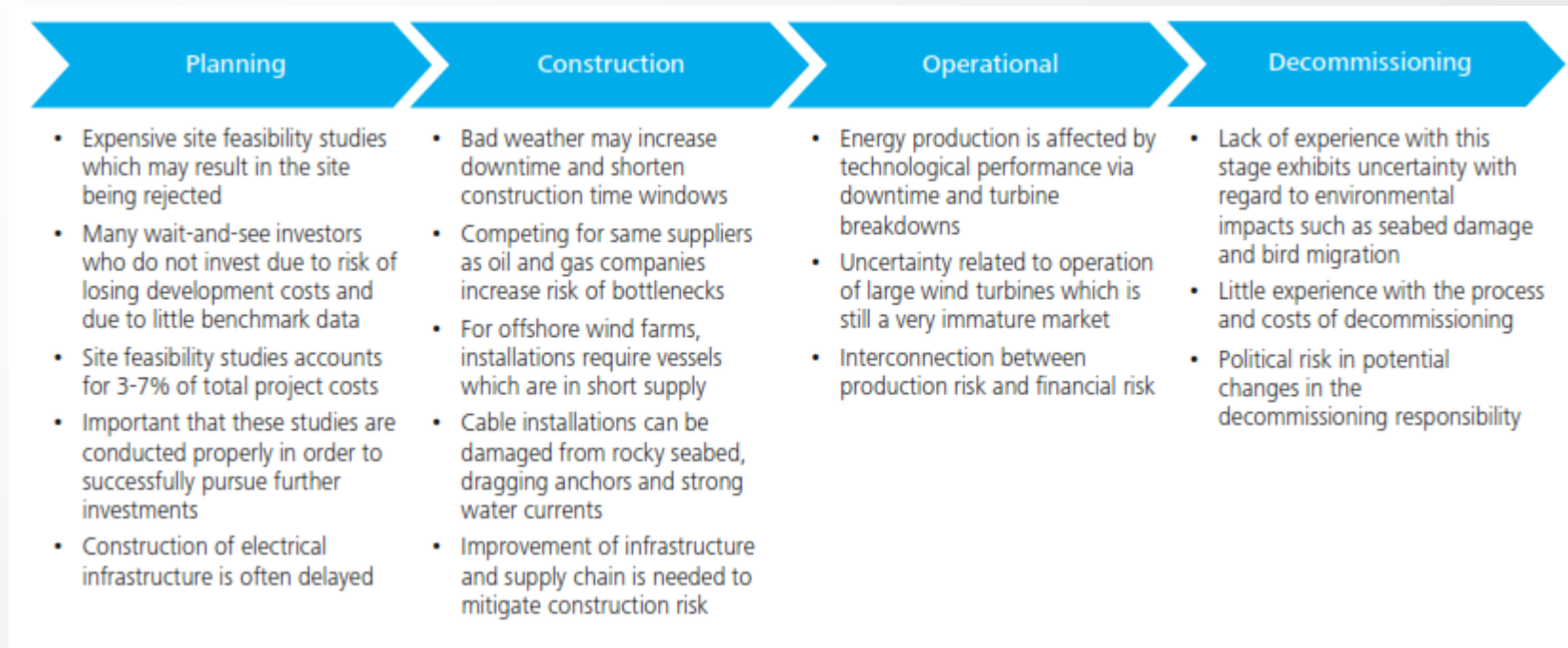




# Risks to be addressed



# Stage Specific Risks



# Stage Specific Risks

Political risk	<ul style="list-style-type: none"><li>• Governmental support and subsidies can affect whether the project is feasible</li><li>• Duties and customs on construction elements affect the quality of construction elements and the country of sourcing</li><li>• Basel III and Solvency II can be subject to changes (this also transfers into financial risk)</li></ul>
Economic risk	<ul style="list-style-type: none"><li>• Energy demand and electricity prices may fluctuate widely, but are often fixed through long-term PPAs</li><li>• Competition with other power sources with special focus on LCOE</li><li>• High inflation may carve out the value of cash flows relative to up-front investments</li><li>• Commodity prices risk that may increase overall project costs</li></ul>
Financial risk	<ul style="list-style-type: none"><li>• Lender appetite determines if lenders compete to offer the best loan terms</li><li>• Liquidity in project finance markets of syndication and securitisation markets has reduced in the aftermath of the financial crisis and the credit crisis</li><li>• Production risk due to wind variability imposes both liquidity risk and credit risk</li></ul>
Other risk	<ul style="list-style-type: none"><li>• Lack of qualified workforce may affect the quality of the wind farm development, construction and operations</li><li>• Technological advancements may increase the opportunity cost of capital and decrease the value of the wind farm</li><li>• Weather conditions in the development, construction and operational stage</li><li>• General risk related to a rather immature offshore industry</li></ul>

# Risk Analysis

Risks are different in each project phase

## Development phase

### No project!

No permits  
No tariff / PPA  
No contracts  
Not enough money

## Construction phase

### Delay and cost overruns

Scope gaps  
Contractor delays  
Adverse weather  
Accidents

## Operational phase

### Lost revenue

Lower availability  
Higher O&M cost  
Lower prices  
Less wind

## Mitigation tools

Project management  
Detailed planning  
Committed sponsors

Project coordination  
Solid contracts (LDs)  
Contingency budget  
Insurance

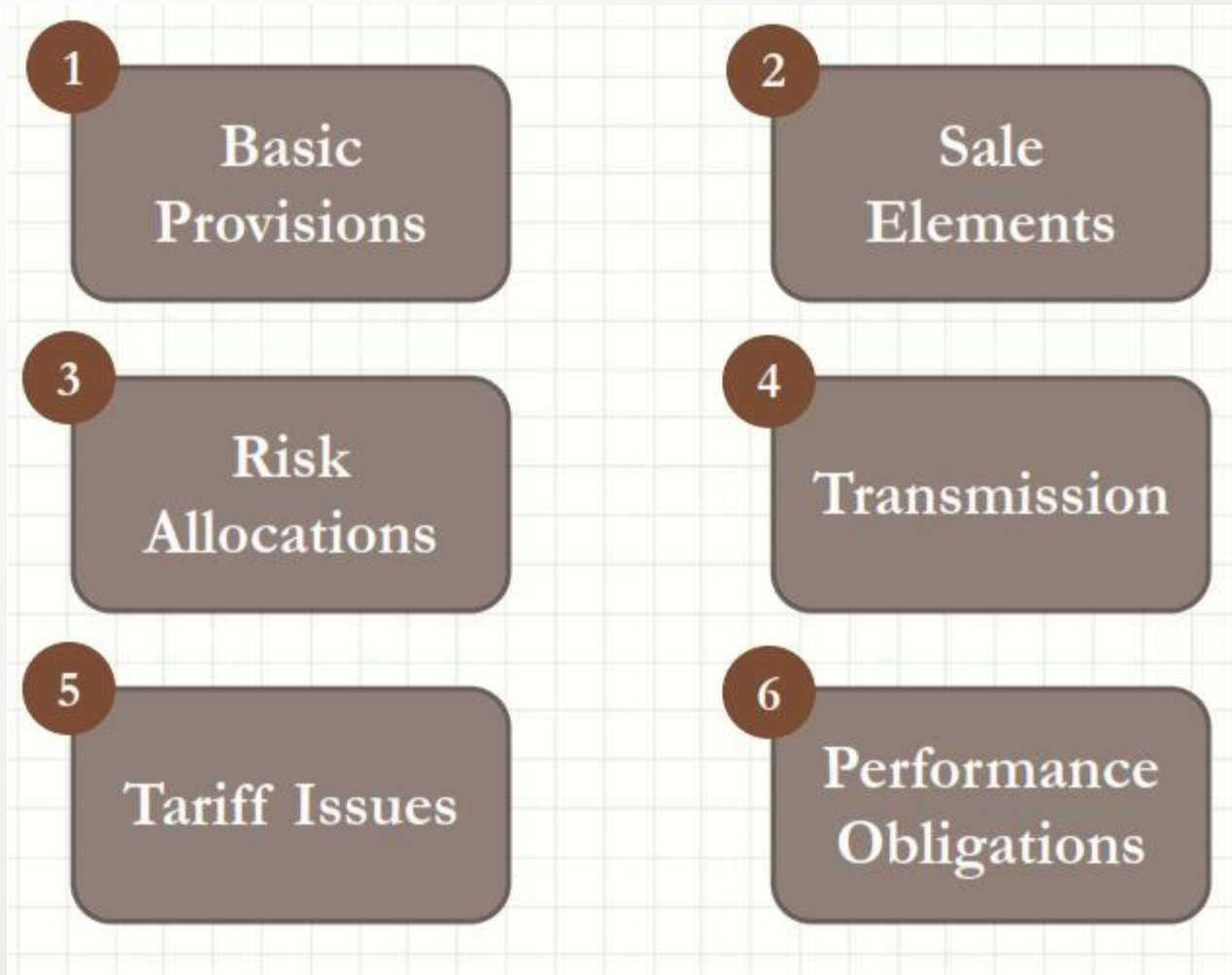
Project management  
LT O&M contract  
Turbine manufacturer commitment  
Insurance

# Project Risk Assessment Matrix

Risk phase		Risk type	Likelihood	Financial impact	Risk owner
<ul style="list-style-type: none"><li>• Planning</li><li>• Construction</li><li>• Operations</li><li>• Decommissioning</li><li>• Not stage specific</li></ul>		<ul style="list-style-type: none"><li>• Political risk</li><li>• Economic risk</li><li>• Financial risk</li><li>• Other risks</li></ul>	<ul style="list-style-type: none"><li>• Unlikely</li><li>• Rare</li><li>• Possible</li><li>• Likely</li><li>• Very likely</li></ul>	<ul style="list-style-type: none"><li>• Insignificant</li><li>• Small</li><li>• Moderate</li><li>• Great</li><li>• Critical</li></ul>	<ul style="list-style-type: none"><li>• Equity sponsors</li><li>• Lenders</li></ul>

Probability of risk materialising						
		A – Unlikely (<1%)	B – Rare (1-10%)	C – Possible (10-50%)	D – Likely (50-90%)	E – Very likely (>90%)
Potential impact	1 – Critical					
	2 – Great					
	3 – Moderate					
	4 – Small					
	5 – Insignificant					

# PPA Negotiations



# Electricity Invoices

Formats and Components of Electricity  
Billing

# Bundled v Unbundled

- Typical sites on bundled billing:
  - ~ Sites that have remained on franchise tariffs.
  - ~ Domestic supplies
  - ~ Small contract electricity supplies (<\$25k annual spend)
- Typical sites on unbundled billing
  - ~ Large contract electricity supplies



# Charge components

- Energy - generator, retail margin
- Network - transmission + distribution
- Market - NEM fees
- Metering - fee for each metering point
- Environmental - renewable energy, retailer obligation scheme pass-through fees

# Energy Charges

- Account for the physical commodity used by the customer
- Largest negotiable cost element
- Quoted and charged in \$/MWh or c/kWh
  - ~ For large sites, prices usually split into Peak and Off Peak periods (plus a shoulder period in ACT and NSW).
- Contract rates will be escalated by losses when invoiced
- Determined by the underlying futures market prices when contracting

# Losses

- Energy lost between generation and the point of use
- Expressed as a percent (e.g. 4.8%) or a factor (e.g. 1.048)
- Only apply on unbundled pricing arrangements
- Will cause your billed rates to differ from your contract rates
- Energy rates escalated by DLF and TLF multiplied together
- Environmental and market charges escalated by DLF only
- Network and metering charges are not impacted by losses
- Updated annually from 1 July by the Australian Energy Market Operator and published on their website
  - ~ So, from 1 July your billed rates may change, even if your contract rates haven't!

# Environmental Charges

- Federal and State Government schemes
- Allow retailers to pass on the costs of meeting legislated environmental schemes to the end user
- **Are a negotiable element** of your contract/billing
  - ~ Differences between retailers' enviro prices can be greater than the differences between their energy prices
  - ~ Important to analyse combined energy and enviro rates when comparing retailer offers
- Are escalated on bills by the Distribution Loss Factor
- Depending on the State, enviro charges will form around 4-10% of total bill costs
- If you don't request firm enviro prices, your retailer will usually amend prices during the contract to follow market movements

# Network Charges

- Covers the 'poles and wires' costs
- Passed through at cost by your electricity supplier
- Charge structures are designed to incentivize customers to use electricity in a way that relieves stress on the supply network - e.g. peak/offpeak rates, kVA demand charges
- Prices fully regulated and set annually (usually)
- Most network providers give the customer several choices of network tariff. The lowest cost option can be selected
- Typically form 30-50% of bill costs depending on site location and type of usage
  - ~ This proportion is increasing due to significant investment requirements across the networks
  - ~ For example, NSW network prices increased by around 20% from 1 July 2010

# Market Charges

- Costs applied by the Australian Energy Market Operator for running the market
- Retailers can recover AEMO's costs from the customer by passing through charges on invoices
- Two charges which change each 1 July:
  - ~ AEMO Ancillary Services Fee
  - ~ AEMO Market Participation Fee
- Both charges will usually amount to <1% of total bill cost, and are non-negotiable, so significant management is not merited

# Metering Charges

- Covers the costs of installing and maintaining a site's electricity meter, as well as recording and processing usage data
- Is a negotiable charge element:
  - Customers can contract directly with a metering provider and ask retailer to pass through costs; or
  - If the Customer does not nominate a metering provider, the retailer will appoint one on the customers behalf.
- Typically, a saving of \$100-200/per meter per annum (10%-20%) can be made under option 1
- Advantages of Contracting Directly with a Metering Provider:
  - Typically lower metering charges
  - Direct access to online metering data
  - Usage alarms (high demand etc)
  - Linking other utilities for reporting (water, gas)
  - Loss of supply notification

# GreenPower

- Some customers choose to make a voluntary purchase of electricity generated from renewable sources
- “GreenPower” is the Federal Government’s renewable energy program
- Purchasing GreenPower is purely a ‘bolt-on’ purchase
  - ~ There is no alteration to your physical supply of electricity
  - ~ GreenPower and electricity purchases can be ‘decoupled’ and bought through different providers




# Key Points

- The Futures Market is the main driver of energy contract rates
- Network charges are regulated, but savings can often be made by switching tariffs
- Losses apply to energy, environmental and market charges
- Environmental charges are separately negotiable
- Metering services can be contracted separately and passed through

# Contracting Principles

# Types of Contract

Decreasing budget certainty, but *potentially* higher reward



1. Fixed price fixed volume forward contracting

2. Flexible forward purchase of variable volume

3. Fixed block purchase (e.g. with generator) with partial pool exposure

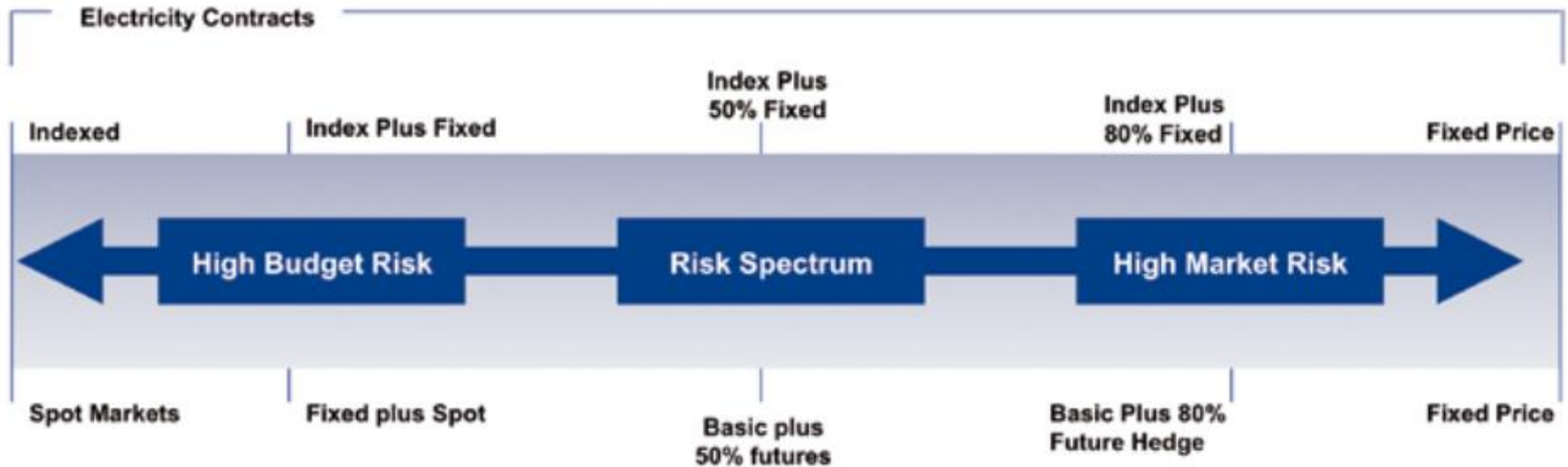
4. Portfolio purchase of fixed volume (partial pool exposure)

5. Managed pool exposure with active demand management or financial cover

6. Pool price pass-through

**Over 95% of contract customers use Option 1**

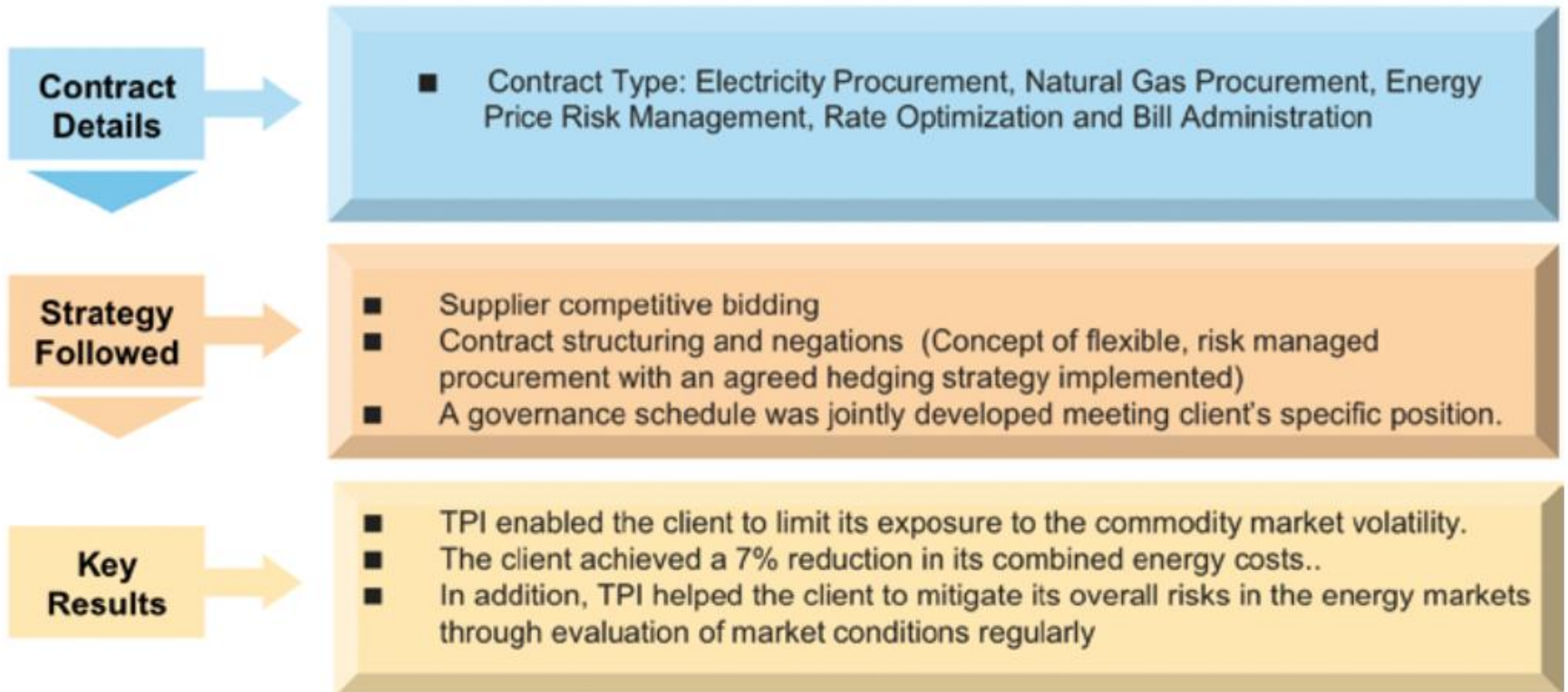
# Types of Contract



# Retail Market Players

	What do they Do?	Why Should?	Why Shouldn't?
<b>AGGREGATORS</b>	Aggregate loads across various individual consumers, and buys them under single purchasing contract	Higher time efficiency for small consumers, lower risk, less paper work and better negotiations	Generally for long-term, fixed price contracts; no customer service; some accounts subsidize others
<b>BROKERS</b>	Don't own generation; negotiate on consumers behalf; act as supplier/ consumers agent.	Saves times; reduces negotiation process as they negotiate on consumer behalf to get them the best deal; scrutinize various options(suppliers) before finalizing the deal.	No strategic energy planning; fee structure can create misalignment; may have affinity for a particular or set of supplier; limited relationships across all suppliers.
<b>CONSULTANTS</b>	Have no stake in generation neither contact suppliers directly; Works on behalf of user to secure contracts	Neutral; independent advice based on qualitative and quantitative market research; higher transparency	Higher fee; not for small/ medium consumers
<b>SUPPLIERS</b>	Owens generation, can be engaged directly to users	Higher negotiation options, no middle management fee; single point of contact	No transparency; difficult negotiation process in absence of data/ understanding

# Example Consultant



# Stacked bid electricity auction

Generator	Capacity Bid (MW)	Bid Amount (\$/MW)	Capacity Accepted (MW)	Cumulative Capacity Dispatched (MW)	Bid Acceptance	Price Paid to Generators for Capacity (\$/MW)
Solar Farm A	1	\$1.75	1	1	Accepted	\$5.60
Wind Farm A	2.5	\$3.00	2.5	3.5	Accepted	\$5.60
Hydro Plant A	3.5	\$3.45	3.5	7	Accepted	\$5.60
Coal Plant A	8	\$3.65	8	15	Accepted	\$5.60
Coal Plant B	4	\$3.80	4	19	Accepted	\$5.60
Natural Gas Plant A	5	\$4.90	5	24	Accepted	\$5.60
Natural Gas Plant B	4	\$5.60	1	25	Partially Accepted	\$5.60
Natural Gas Plant C	7	\$6.15	0	25	Not Accepted	\$0.00
Total	28		25			



# Active Management Strategy

- Seeks to spread purchasing risk over multiple buys
  - ~ Instead by single purchase (Fixed Price Strategy)
    - \* Some believe that locking in a fully fixed price will eliminate their risk exposure, however this can be the riskiest strategy of all if you consider lost downside price movement opportunity
- Active management addresses both the upside and downside risks associated with locking in energy prices

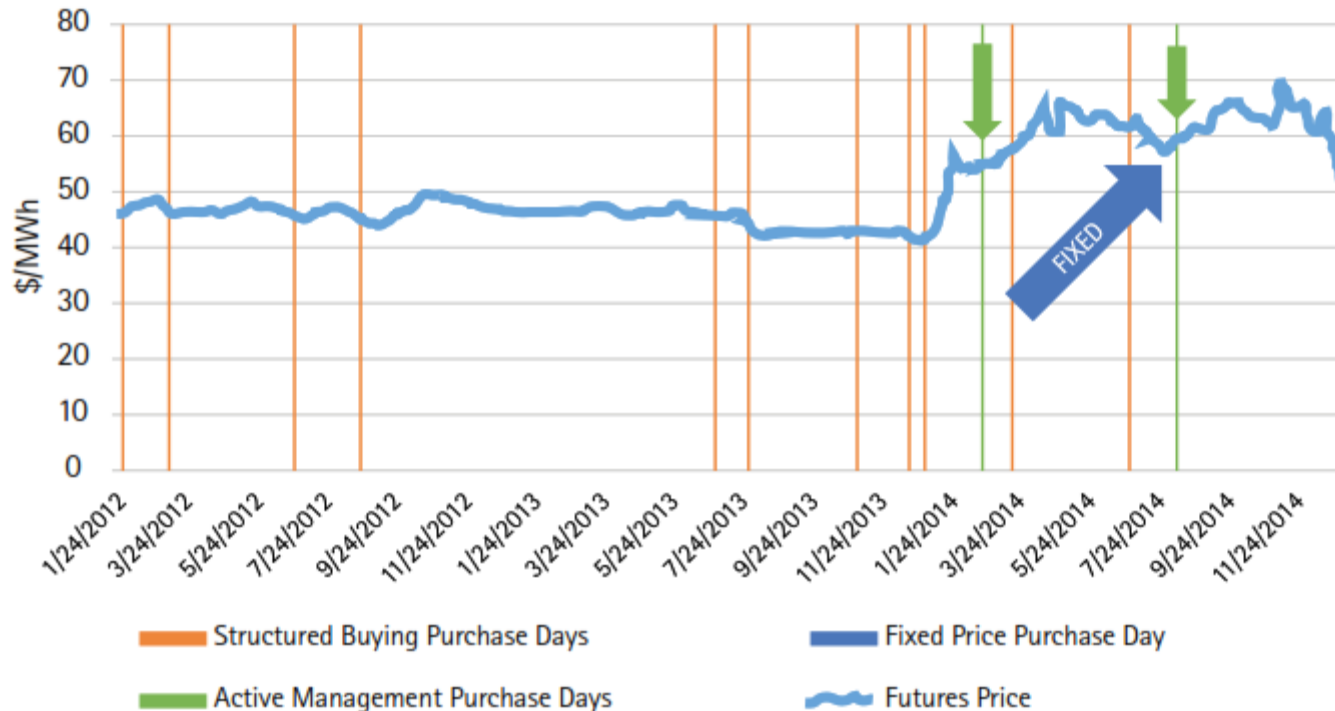


# Structured buying Strategy

- Percentile approach that is used to determine when there is relative value for a given forward strip at today's price compared to the historical trading range
- Contango is a term that describes the down-trending nature of commodity futures contracts approaching the settlement date (last trade).
- Structured buying takes advantage of intrinsic market volatility and contango to buy down the curve over the two years leading up to the delivery period
- This dollar cost averaging approach allows clients to limit risk exposure while still buying opportunistically

# Structured buying

BGE 2015 - Strategy Comparison



Fixed Price Purchase Day	Active Management Strategy		Structured Buying Strategy	
100% Jan-Dec 2015 Locked: 8/1/2014	33% Block		12 Purchases Over 3 Year Period	
	Locked: 2/20/2014	\$ 53.24		
	33% Block		Average Lock	
	Locked: 8/18/2014	\$ 57.75		
	33% Real-Time	\$ 60.07	10% Real-Time	\$ 60.07
Final Price	\$ 57.671	Final Price	\$ 57.020	Final Price
				\$ 48.793

# 4 Base strategies

## US Markets

Value-Based: Targeted fixed %, purchasing based on down-side value signals

### 1. Conservative

- 90-100% fixed; 25th percentile buys; Aggressive Stop-Loss set close to initial budget.
- Recommended for Q1 for most N.A. electricity zones. The volatility of spot and futures market pricing for this quarter suggests a strategy of locking in larger tranches early.

### 2. Medium

- 50-80% fixed; 10th percentile buys; Less Aggressive Stop-Loss above initial budget.
- Recommended for Q2 and Q3 for most N.A. electricity zones, where summer volatility is possible but has been limited in recent years. Assures enough index exposure to take advantage of any low spot prices.

### 3. Aggressive

- 30-50% fixed; 2nd percentile buys; Stop-Loss well above initial budget.
- Recommended for Q4 for most N.A. electricity zones, where spot prices have been lower than the lowest possible future's prices.

Extreme Volatility Avoidance: 100% spot market exposure, purchasing only when up-side risk thresholds exceeded

### 4. Aggressive +

- 0-30% fixed; Stop-Loss 10% above 1-year trading average for quarter.
- Only purchase when Stop-Loss hits. After first Stop-Loss hits, next trade requires higher price.
- Ideal for NYMEX or other markets that exhibit strong contango properties.

# Structured buying Case Studies

## ONE

A Fortune 500 retailer with a \$130m annual electric spend and an existing sophisticated block & index strategy recently migrated to Structured Buying after realizing that they could have saved \$2.5M in 2015 while reducing portfolio price risk exposure by 80% arriving at a more conservative 55% fixed position.

## TWO

A large global industrial client recently migrated to Structured Buying for its two North American sites after considering savings of \$6.1M in 2015 on electricity and \$1M on natural gas.

Prior purchases were guided by supplier intelligence, however a more strategic fixed position could have been achieved at a lower price through Structured Buying.

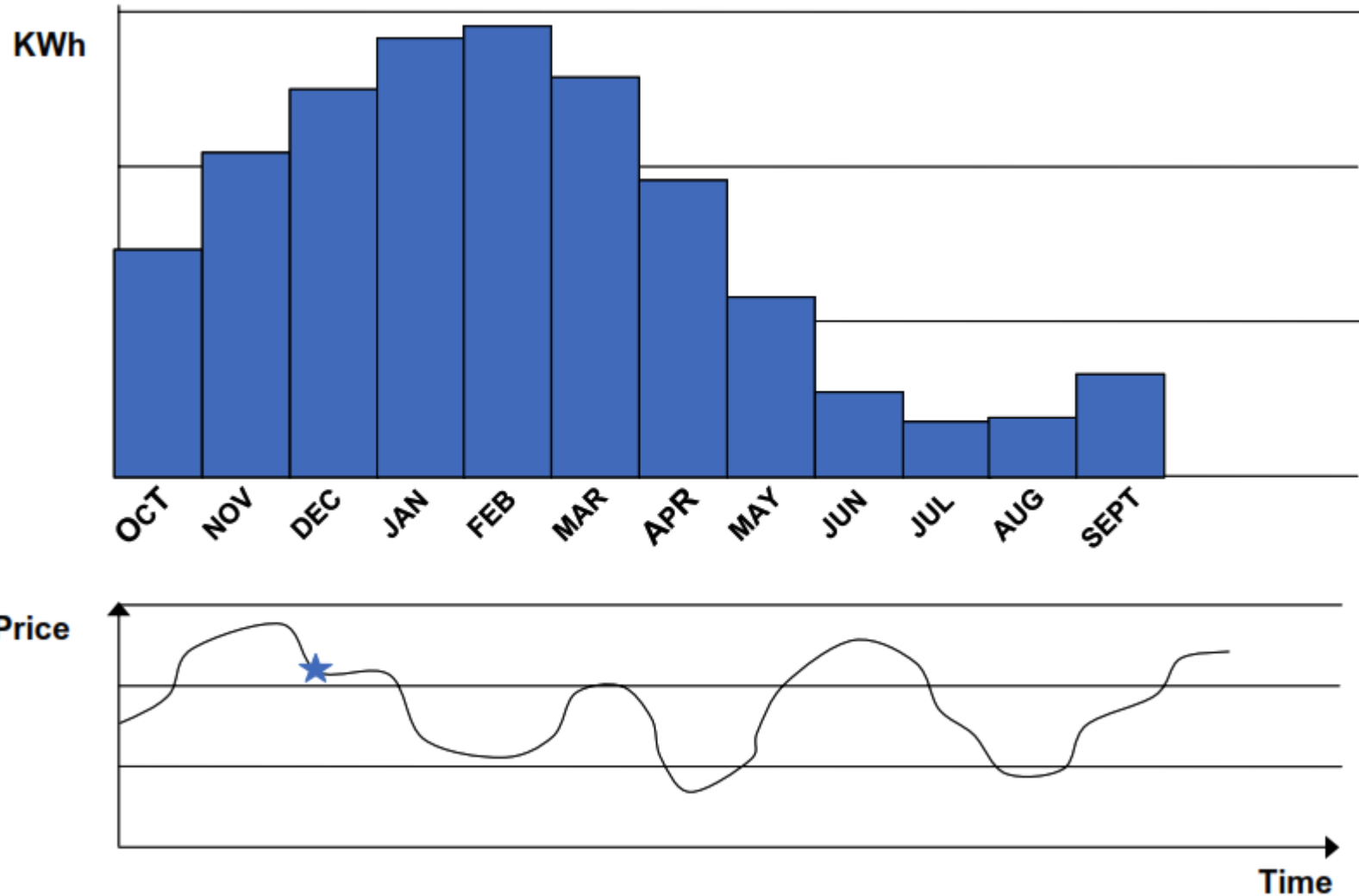
## THREE

A Fortune 500 telecom provider with a deregulated electric supply spend of approximately \$400M would have saved \$29M in 2015 utilizing a Conservative Structured Buying strategy that arrived at their same 90% fixed position, or \$50M through a Mixed strategy nationwide.

# Fixed Price Contract

- All energy bought on one day – 1 in 220 chance of choosing the “right” day
- Supplier provides one price for all portfolio for the supply period
- No transparency of prices
- Price offered by supplier will include a risk premium to account for within day volatility of prices
- Buying all volumes on one day can move the market unfavourably

# Fixed Price Contract



# Traditional Fixed Price Contract

- This procurement strategy fixes all energy requirements on a given day from the market and does not employ any risk management strategy



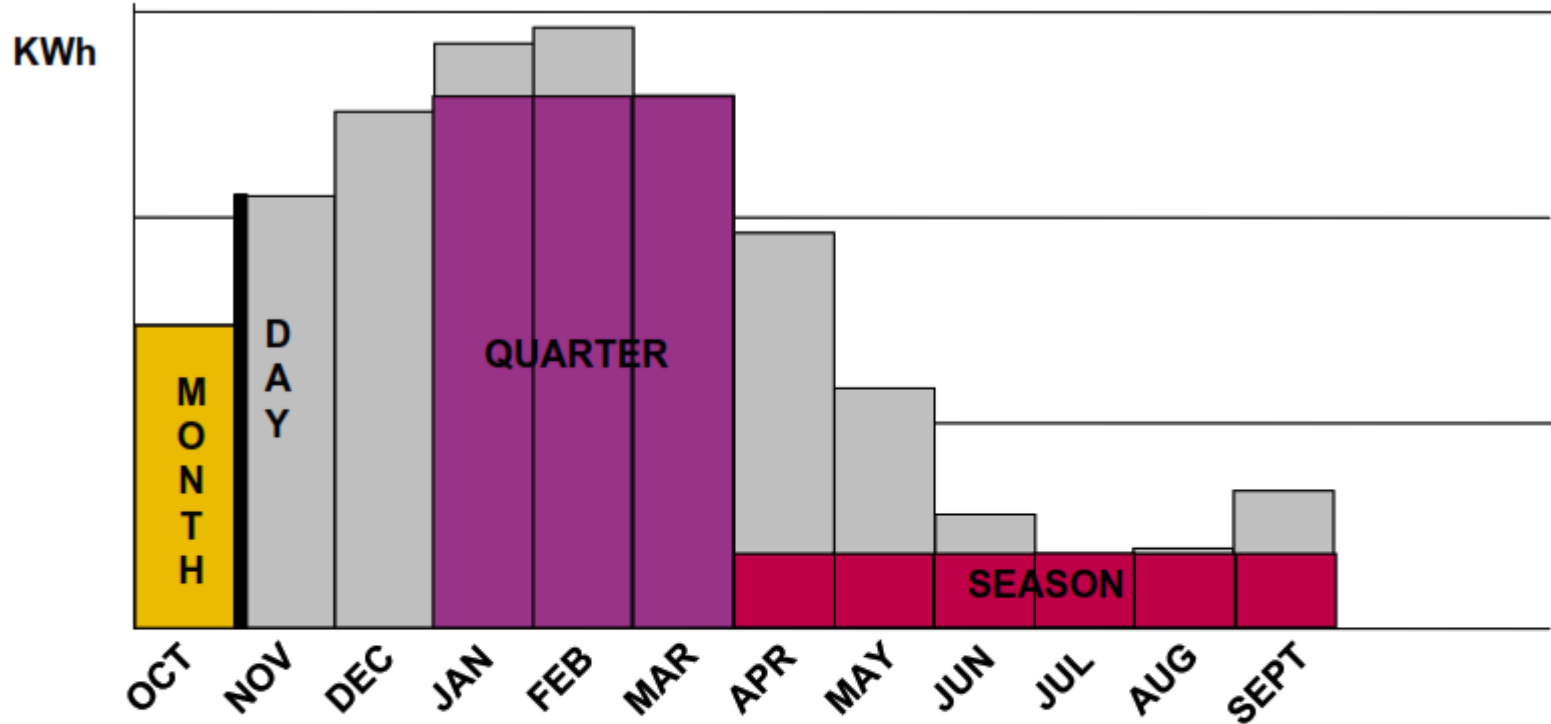


# Flexible Procurement

- Contract with supplier covers
  - the supply agreement for the period of the contract
  - Price of fixed charges e.g. transmission, distribution, supplier cost to serve etc.
  
- All negotiable elements of delivered cost (except raw energy) are competed as part of the tender e.g.
  - Supplier cost to serve
  - Balancing and settlement fees
  - Shaping



# Flexible Procurement



On the wholesale market energy can be bought in

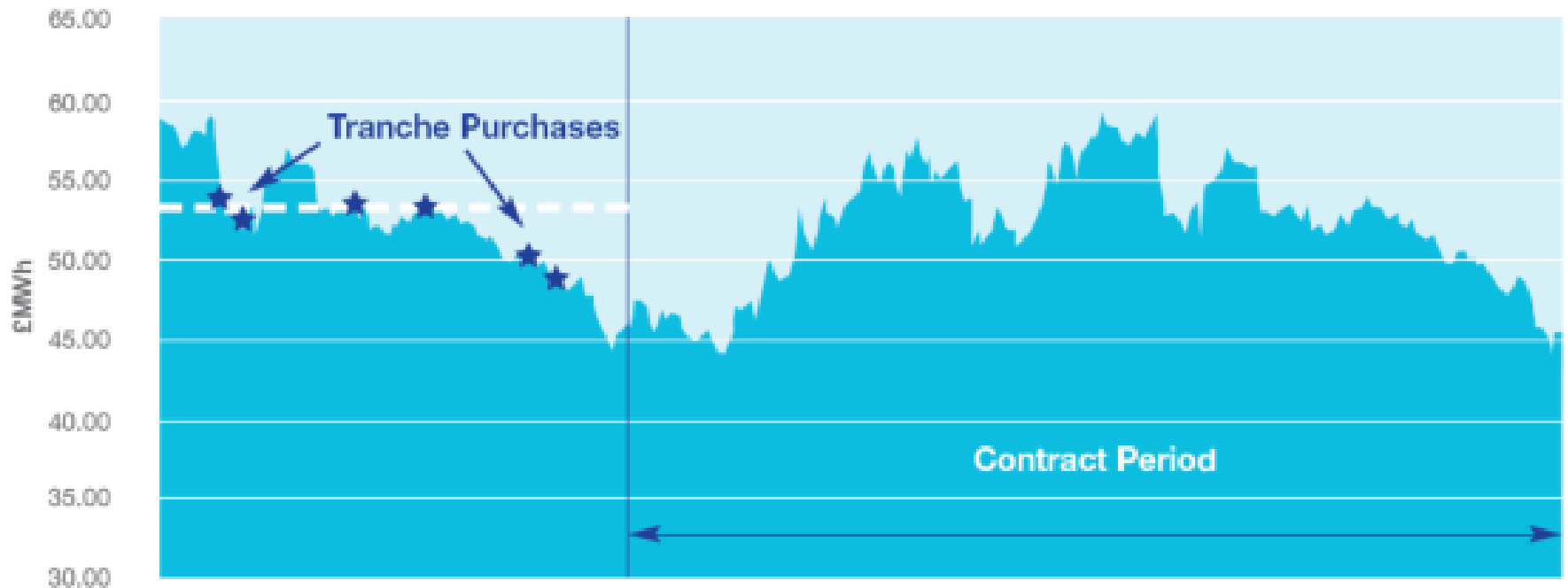
- Month blocks
- Quarterly blocks
- Season blocks
- Day ahead

# Flexible Procurement

- Price of the raw energy is decided as and when the contracting authority decide to buy
- Energy is bought on the wholesale market
  - Every participant competes a set price, incl. producers generators, banks and suppliers
- Bought in “chunks” (known as clips) over a series of purchases
- Usually longer term contracts – up to 4 years
- Price risk can be managed up to 3 years in advance

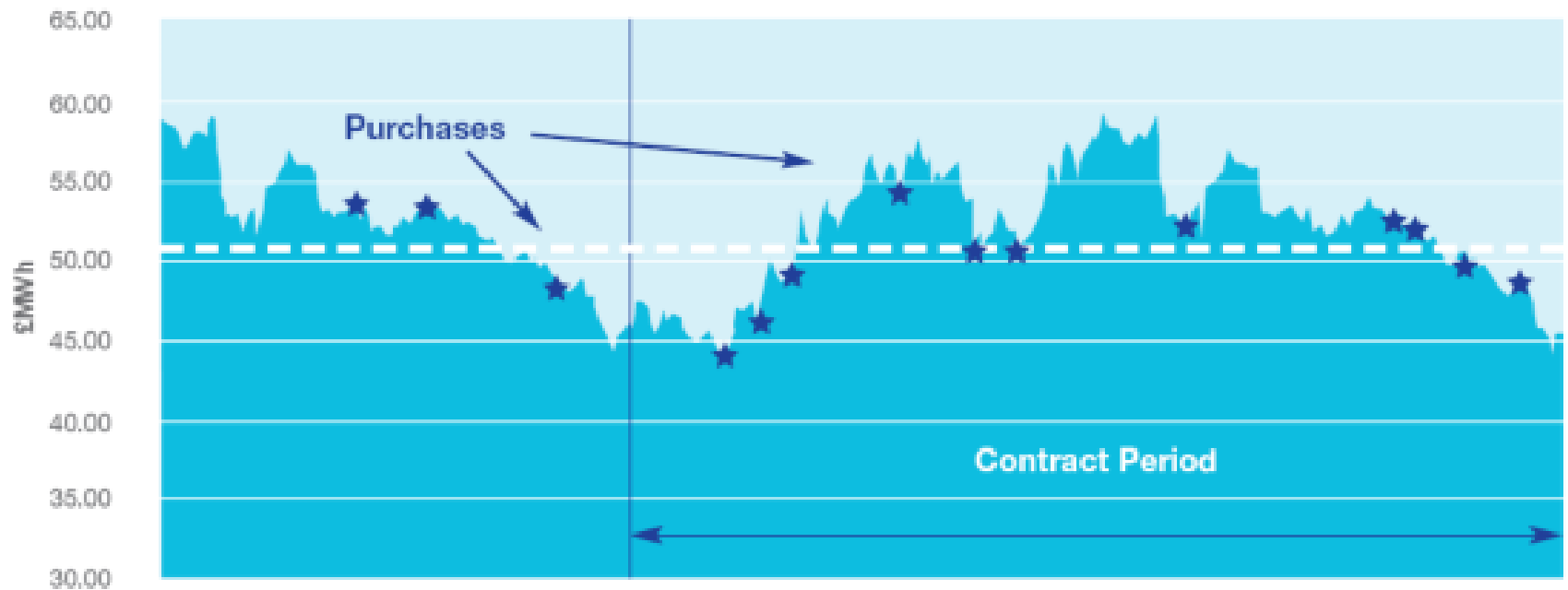
# Flexible Fixed Price Contract

- Procurement method allowing a risk management strategy to be adopted



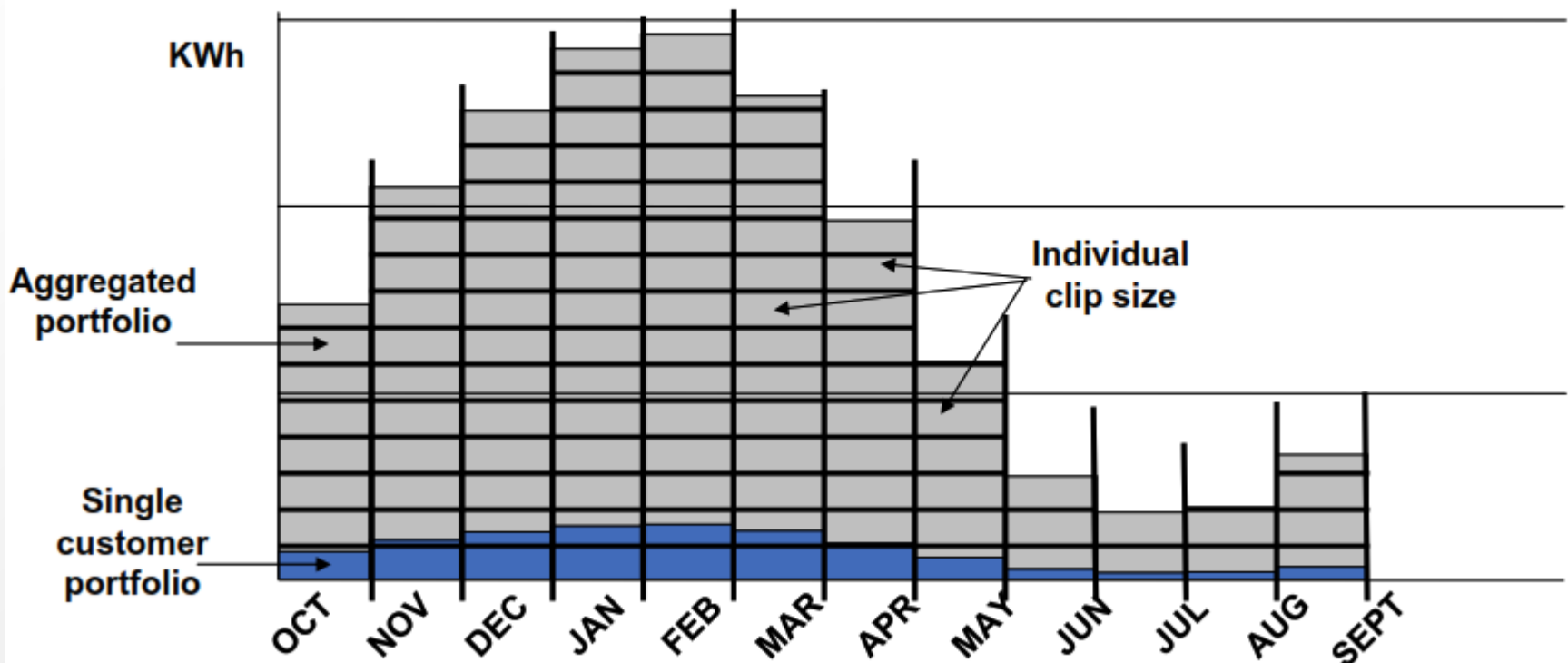
# Flexible Variable Price Contract

- Does not allow for any budget certainty until the end of the contract

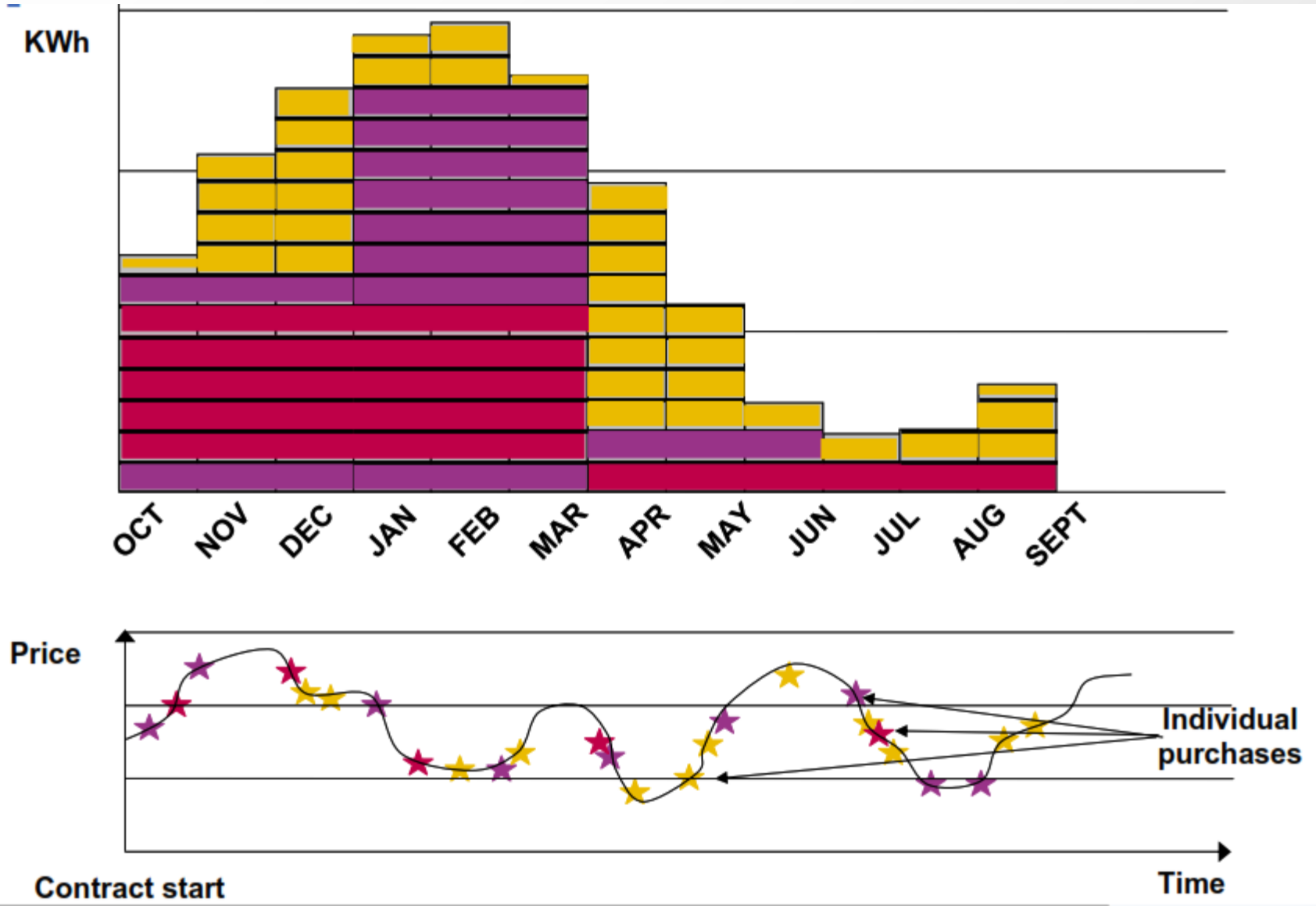


# Aggregation

- Energy is traded on the wholesale market in clips
- Clips are bought in standard sizes, for example 10MWh blocks
- Smaller clips = price premium



# Aggregation

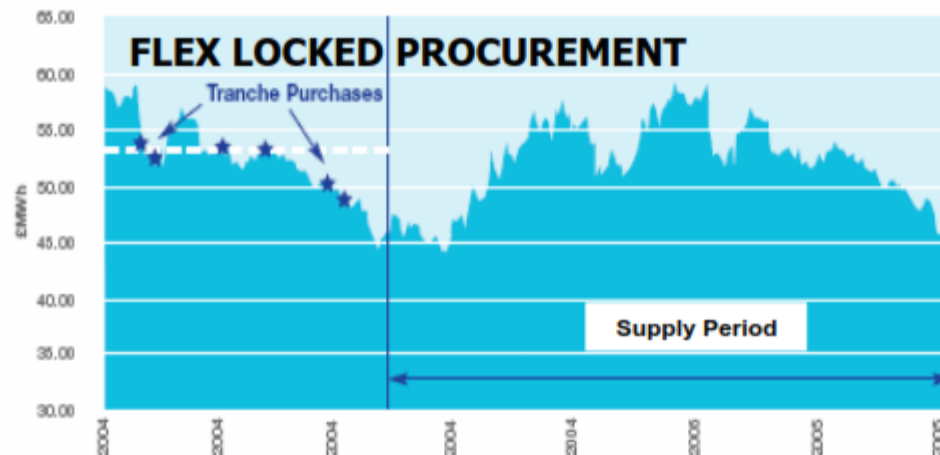


# Aggregation Flexible Procurement

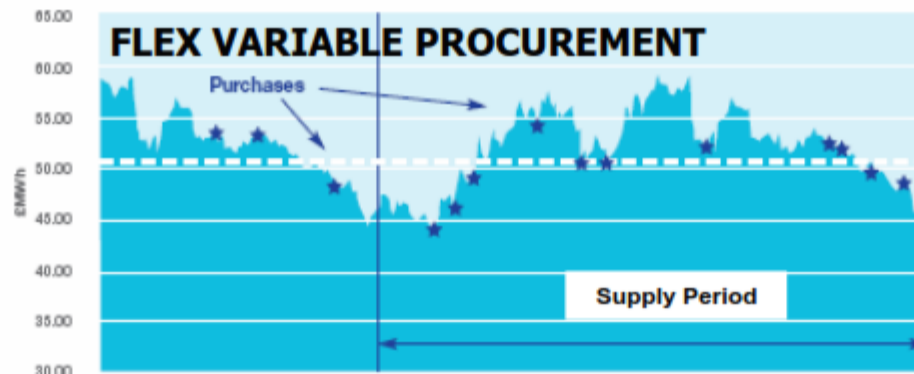
- Contract can begin well in advance of supply start
- Energy bought on multiple days
- Days, months, quarters and seasons bought direct from wholesale market
- Energy can be bought up to **3 years in advance of supply**
- Transparent prices – visibility of prices for all energy being bought
- Aggregated volumes decrease the amount of residual (more expensive) energy
- Avoids volume moving the market

# Risk Management

- The two most common risk options offered by buying organisations are:
  - Flexible locked – gives fixed price for supply period



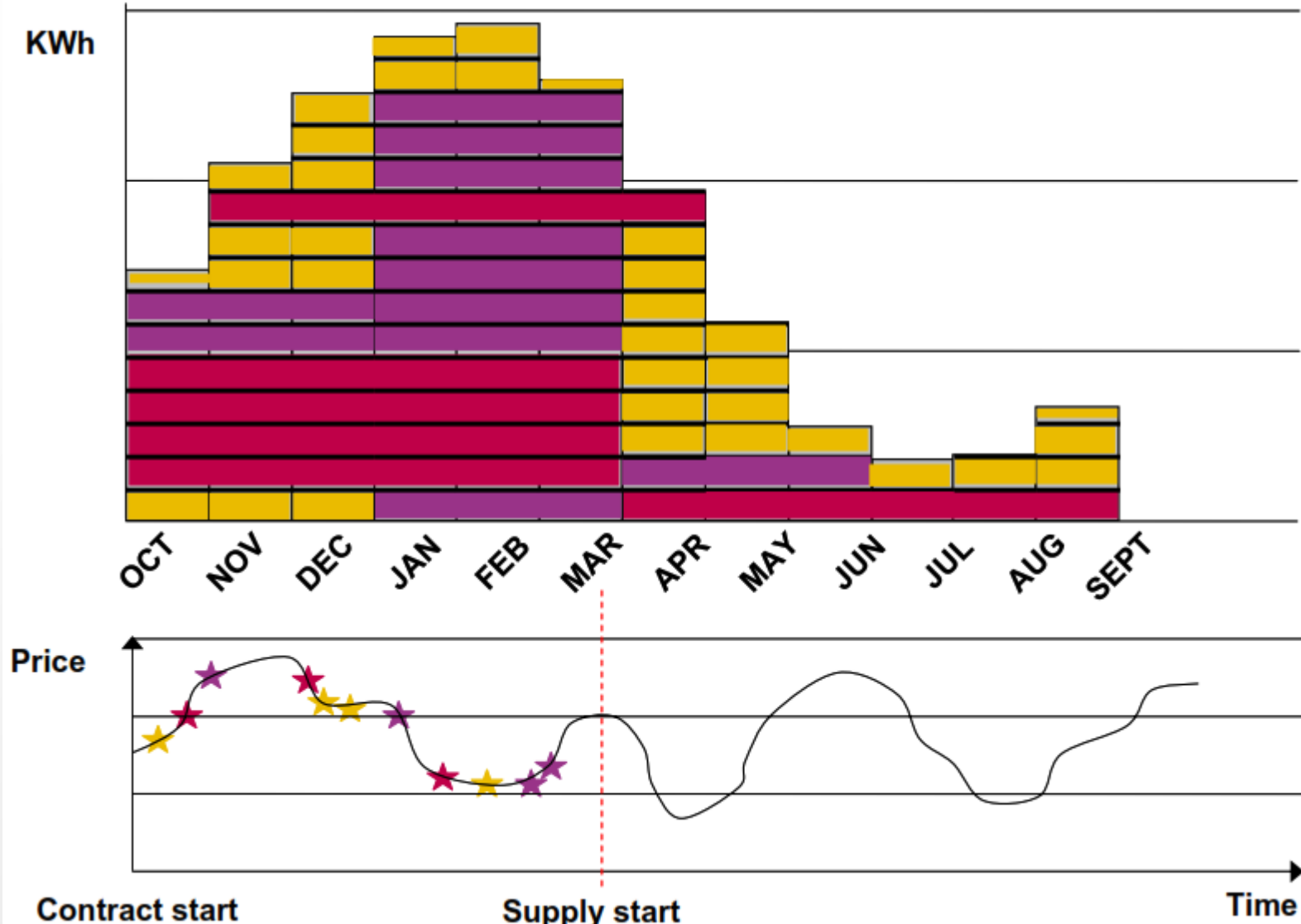
- Flexible variable – price will vary over supply period – reconciliation will be required





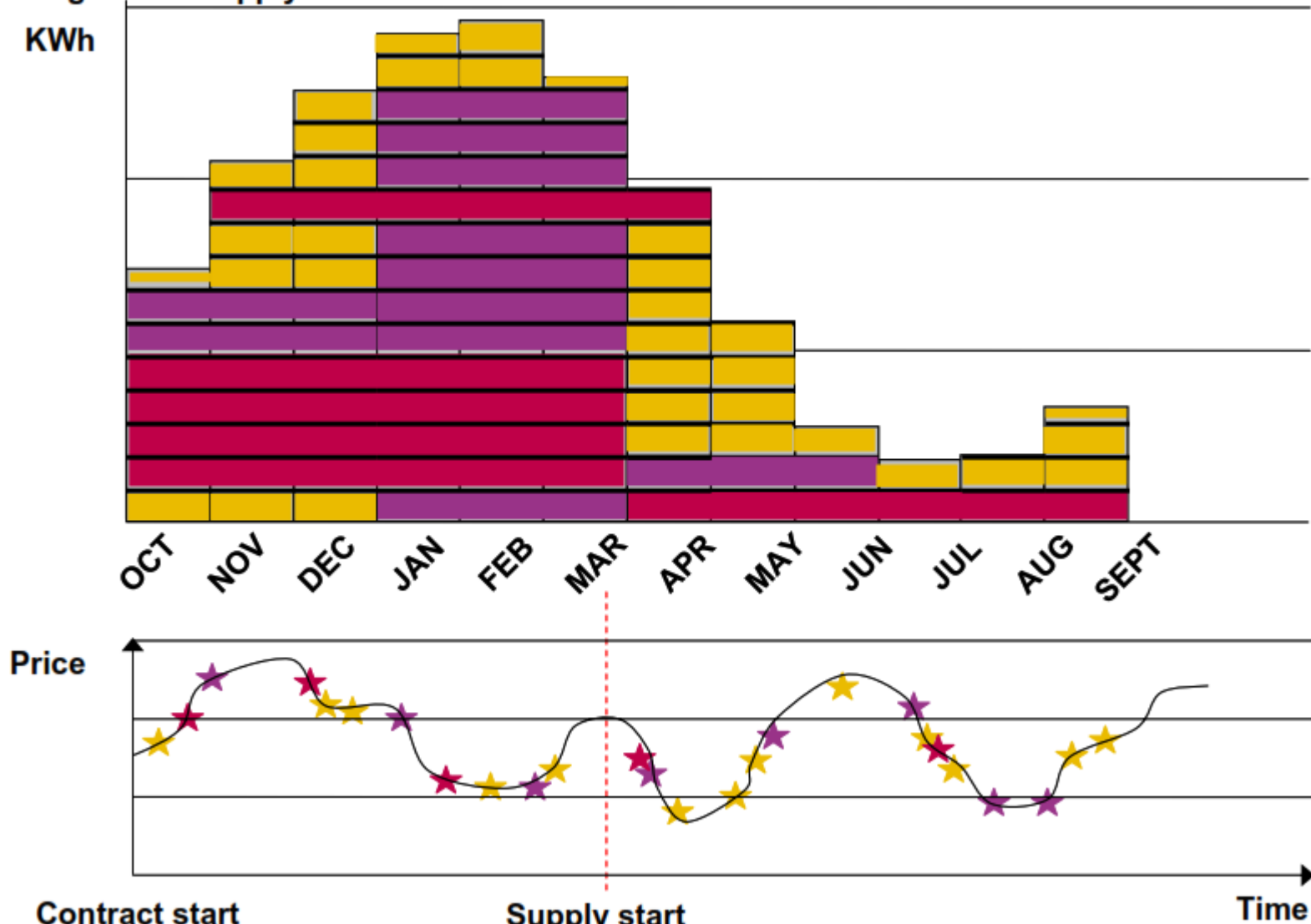
# Risk Management Options

Flex locked: 100% of all volumes locked out prior to start of supply period



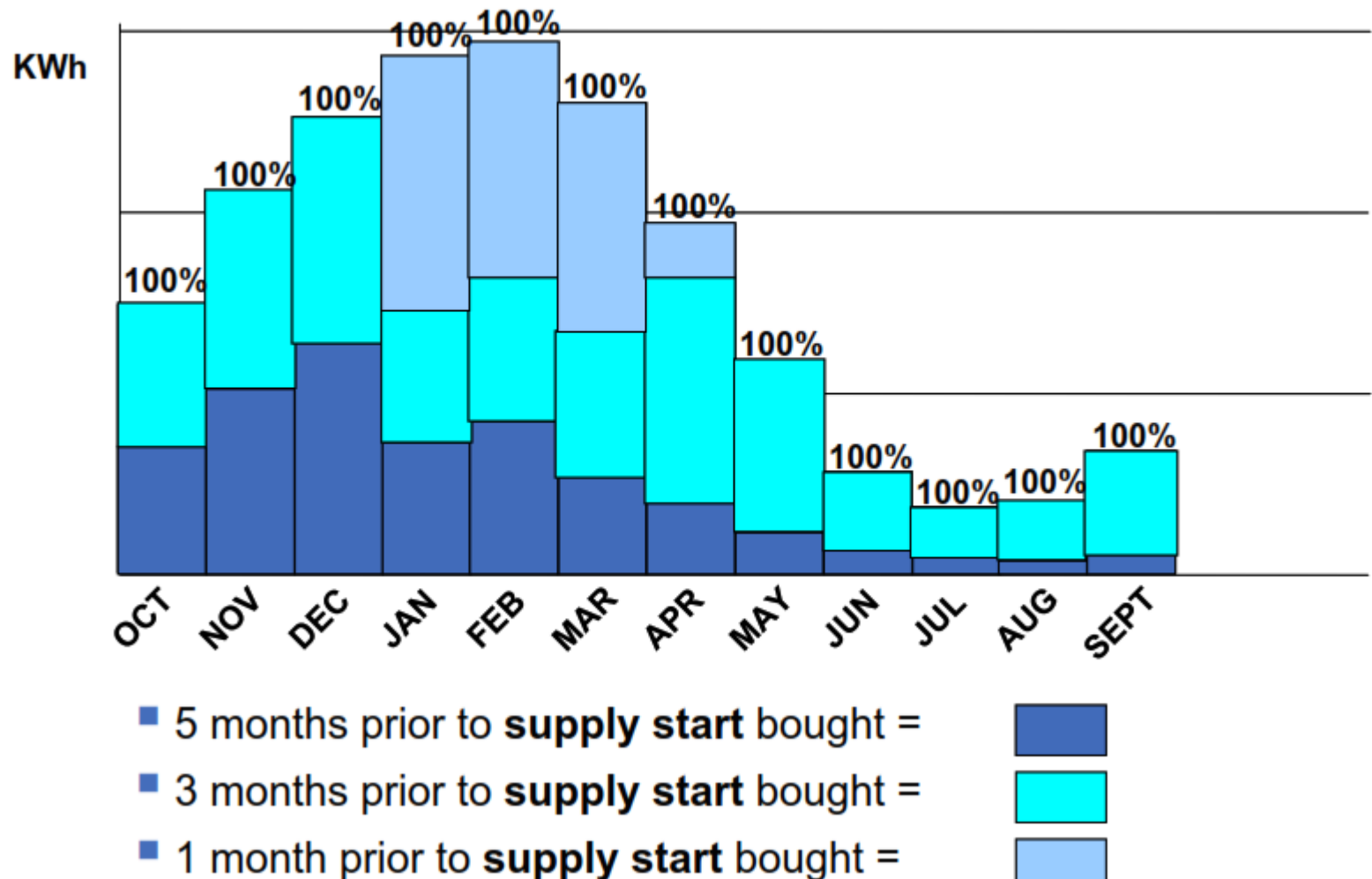
# Risk Management Options

Flex variable: x% volumes locked out prior to supply start, x% volumes bought after supply start



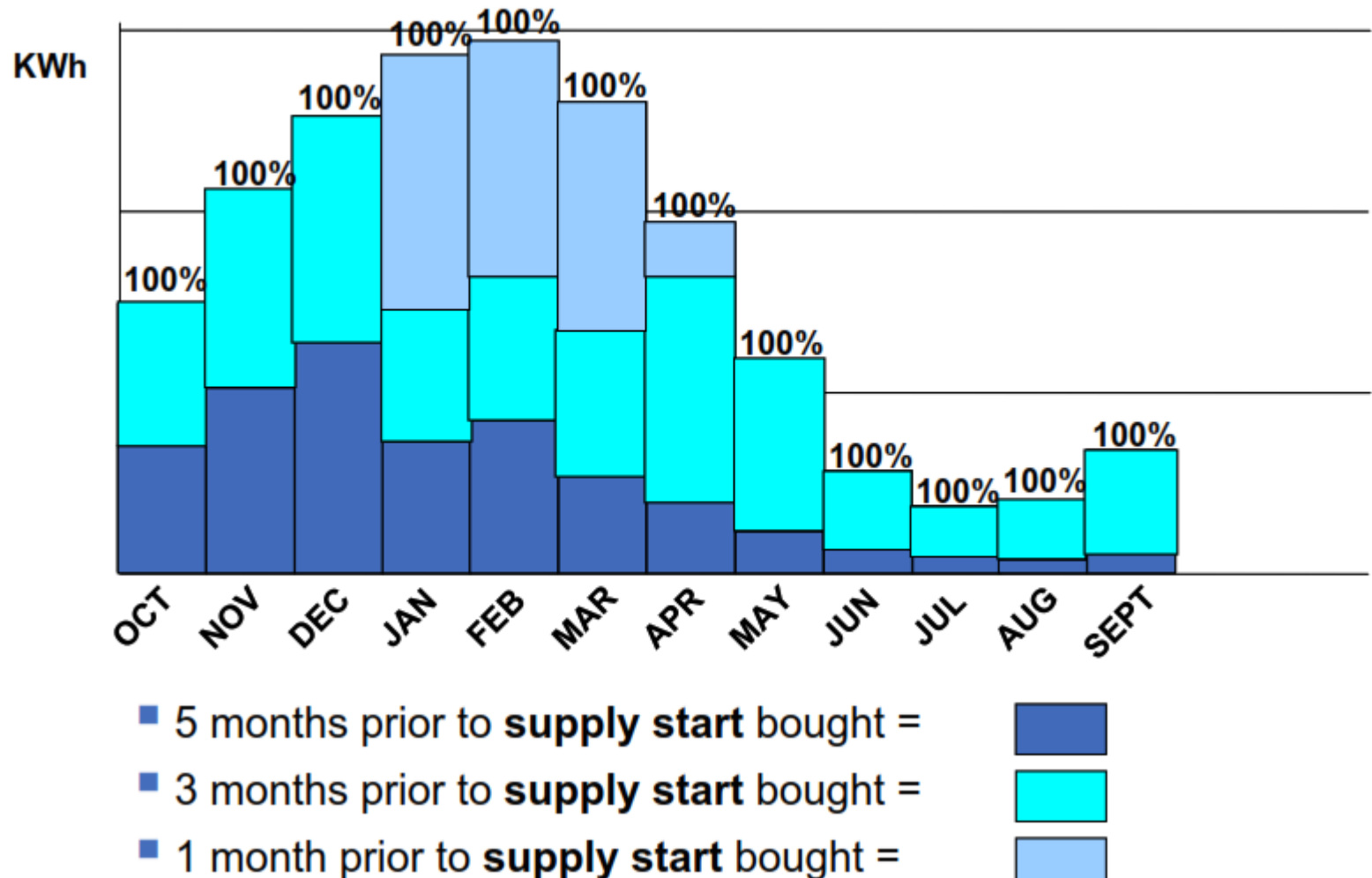
# Strategies: Flex-Locked

All volumes bought prior to supply start:

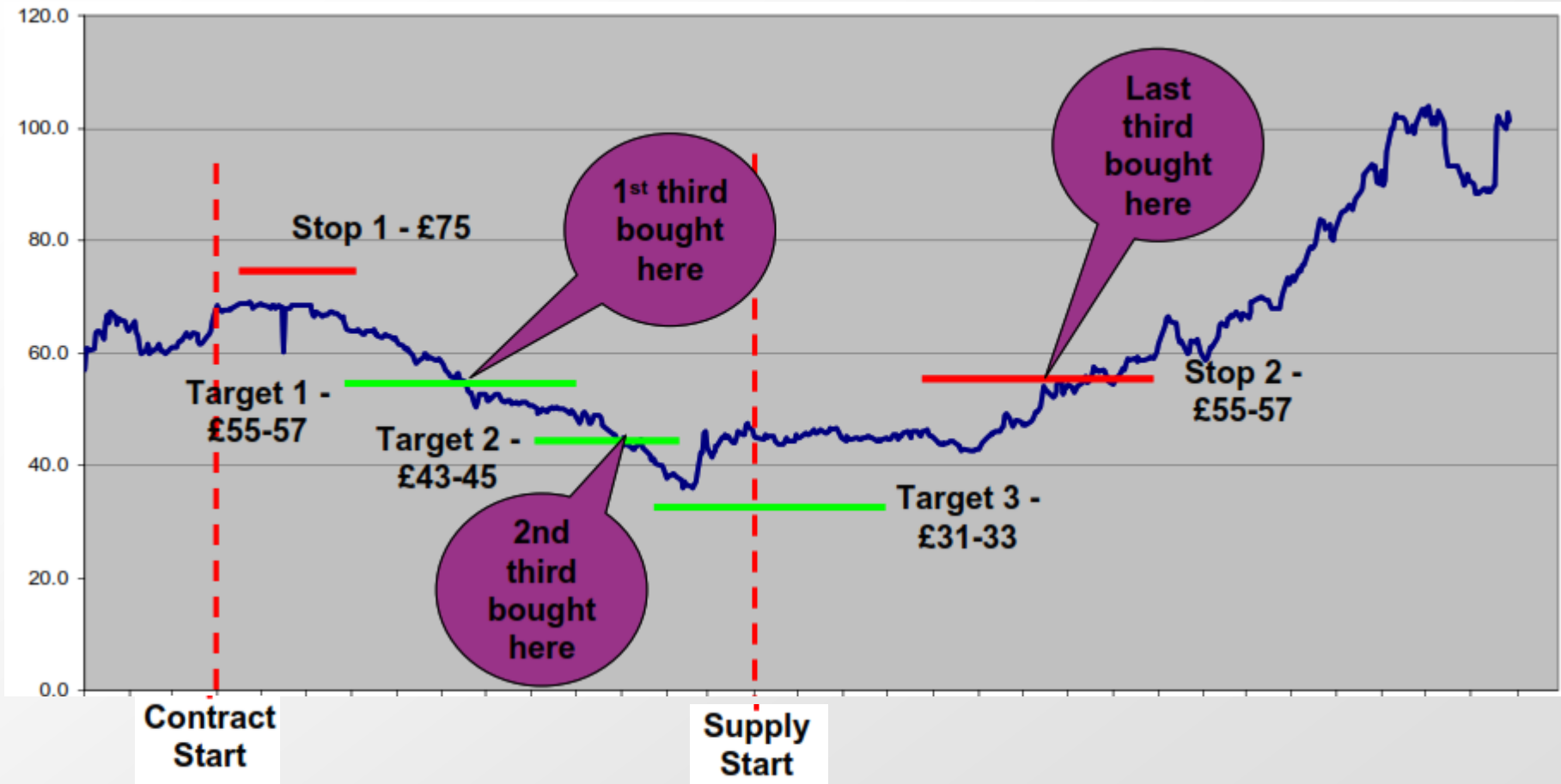


# Strategies: Flex-Variable

All volumes bought prior to supply start:



# Stops and Targets



# Spread of procurement risk



# Best Practice Energy Procurement

- Energy markets extremely volatile
- Prices can vary significantly on a daily basis
  - ~ Extremely difficult to control costs and manage budget
- One way of mitigating this risk is to adopt a flexible, aggregated, risk managed approach to energy procurement
- Adopting a flexible approach to energy procurement allows the purchase of raw energy to be fixed over a number of trades from the wholesale market

# Best Practice Energy Procurement

- Benefits of adopting this method over the traditional fixed price, fixed term are:
  - ~ Buyer not solely reliant on supplier's market view
  - ~ All costs of delivered price fully transparent
  - ~ Flexible purchasing allows for adoption risk management strategy
  - ~ Single procurement from the market may lead to an unfavourable price



# Best Practice Energy Procurement

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# Best Practice Energy Procurement

- Benefits of aggregated volume are:
  - ~ Larger portfolios are more attractive to suppliers
  - ~ Larger portfolios can attract lower supplier margins
  - ~ Aggregation provides the volumes required to purchase from the wholesale market
  - ~ Potential to increase risk management options

# Competitive vs. Traditional

	<b>Competition</b>	<b>Traditional Regulation</b>
<b>Funding</b>	Company funds investments with the expectation that it will be able to charge customers prices that justify those costs.	Ratepayers fund prudently incurred investments in rate base with a virtual certainty of recovering the costs.
<b>Price Determination</b>	Prices set in a market by supply and demand with open-ended possibilities for pricing structures, which means choice for consumers.	Prices set based on cost with limited menu of regulated tariffs.
<b>Market Concentration</b>	Multiple firms compete with one another, with potential competitors providing competitive pressure as well.	Generally one firm, once with a franchise.
<b>What Is Built</b>	Companies, in response to customer demand, will be more likely to invest in less traditional and more energy-efficient forms of generation, including renewables.	Regulators approve what utilities build. This may or may not be the lowest cost investment, and may or may not be technologically innovative.
<b>Capital Structure</b>	Less use of leverage perhaps, reflecting greater investment risk, but more potential for innovative financing arrangements.	Traditional utility regulation accommodates the use of more debt, but limits innovation.
<b>Who Bears Risk of Bad Investments?</b>	Investors.	Consumers.

# Competitive vs. Traditional

<b>Market Activity</b>	The competitive environment is dynamic and subject to entry and exit. This creates a powerful incentive for firms to increase operating efficiency.	Static. Subject to bureaucratic process.
<b>Cost Allocation</b>	Value branding. Independent power companies have a greater opportunity to market different services to different customers.	Cost averaging. Through the regulatory process, costs incurred are averaged out when determining rates, and the ratepayers that incur specific costs may not necessarily pay for them.
<b>Keys To Success</b>	Ability to compete on price, terms, and non-price attributes such as billing arrangements and product innovation (such as green power).	Prudence and accountability in decision making; competence working with regulatory and political policy. Ability to overcome market failures.
<b>Vertical Integration</b>	Greater vertical separation of regulated and competitive activities.	Typically vertically integrated, subject to an internal system of command.
<b>Ownership And Investment</b>	Risk and return expectations will be relatively higher. This will affect what types of entities hold ownership stakes.	Risk and return expectations will be relatively lower. This will affect what types of entities hold ownership stakes.
<b>Marketing</b>	Increased need for marketing, and development of innovative products. Focused on meeting individual customer needs through innovation.	Reduced need for marketing and business development. Largely focused on providing one-size-fits-all solutions for customers.
<b>Price Stability</b>	If price stability is desired by customers, competitive retailers will make such a product available.	The regulatory process eventually allows recovery of all prudent costs. Rates can be slow to respond to changing conditions due to regulatory lag.
<b>Price Signals</b>	Prices tend to reflect marginal costs, the most accurate representation of opportunity cost.	Retail prices can become distorted from marginal costs through the ratemaking process.

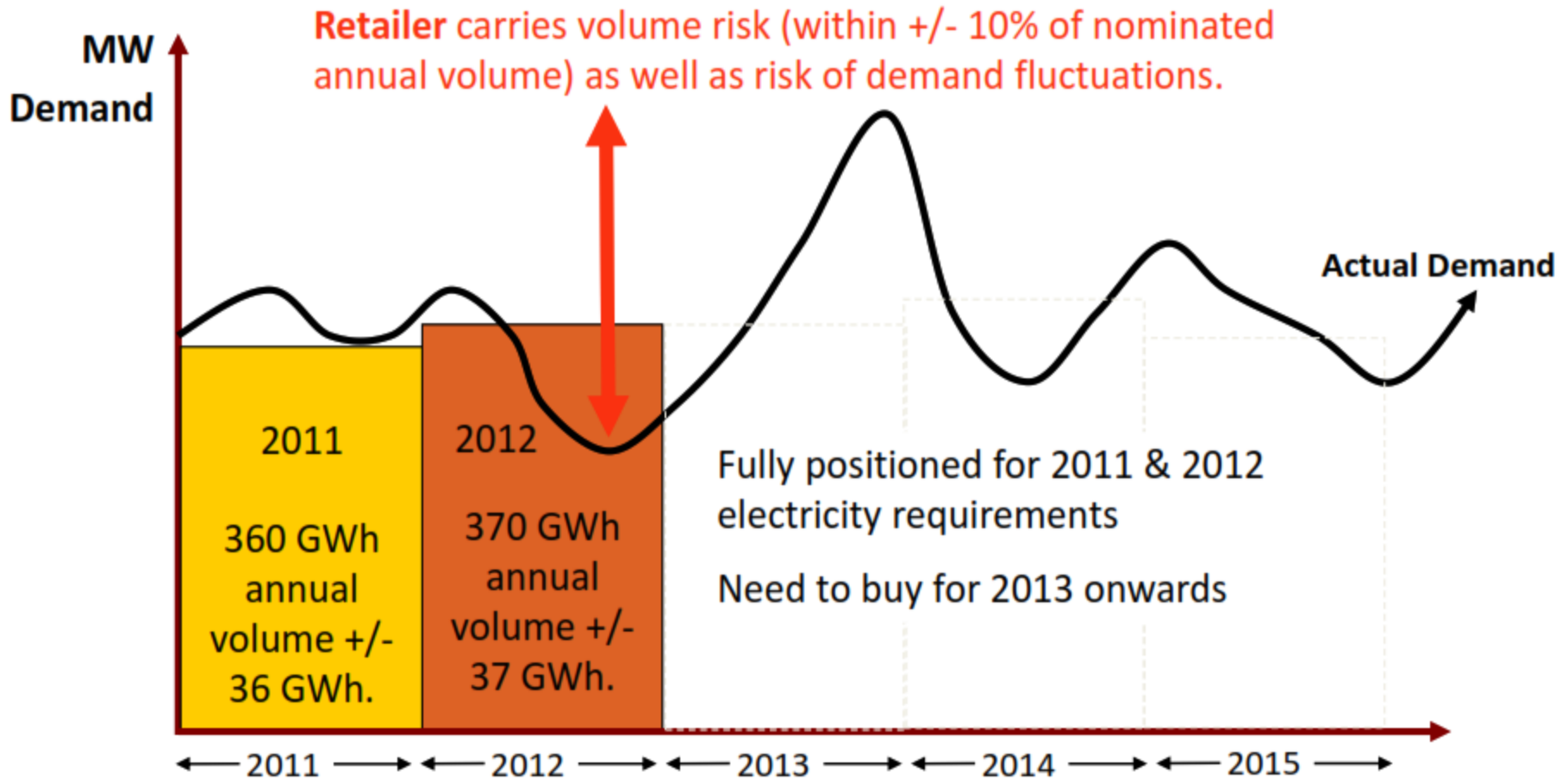
# What does a contract cover?

- Energy price and quantity
- Contribution to mandatory environmental obligations
- Metering (optional)
- Account management
- Billing

*Not:*

- Delivery of energy
- Security of supply
- Regulated charges
- Losses

# Option 1-Fixed Price Fixed Volume



# Option 1-Fixed Price Fixed Volume

- Customer agrees to buy from retailer for fixed price for a set term
  - ~ “Standard” form of electricity contract

Advantages	Disadvantages
All market risk is on retailer - no exposure to rising market prices.	No benefits will be received if market prices fall during the contract.
Standard form of contract with low ongoing maintenance.	Little flexibility should your requirements change mid-contract.
Price certainty - retail elements of an invoice will not change from the agreed rates.	

# Contract Options

- Majority of customers seek a fixed price-fixed volume contract
- Key Features:
  - ~ Customer nominates annual energy usage for each contract year
  - ~ Retailer provides fixed energy rates (and enviro rates if requested) for each contract year
  - ~ Customer is permitted to use, typically, between 90% and 110% of the nominated annual volume at the agreed rates
    - \* Usage outside these bounds may incur penalties
  - ~ No limits on demand
  - ~ Network and market charges are passed through on billing



# Issues to consider when contracting

- Timing
  - ~ Vital in a volatile market
- Approvals process
- Duration of contract sought
  - ~ Short term (e.g. 12 month) contracts for new supplies to allow load profiles to be built
- Volume & site roll-in/roll-out
- Environmental charges (RECs, GECs, NGACs and NRECs)
- Option of franchise prices for new supplies in Queensland
- Additional account services - are services such as electronic billing and data provision required?
- Voluntary GreenPower

# Procurement Process-Timing & Approvals

- Prices can vary significantly on a daily basis
  - ~ Prepare to go to market at short-notice and take advantage of price dips
  - ~ Important to streamline the procurement process in a volatile market
  - ~ Reduce the offer validity period as much as possible in order to lower the retailer's risk premium and maximise the likelihood that the offer is still available when accepting prices.
- A \$1/MWh market movement equates to a cost change of \$50,000 per annum for a 50 GWh supply

# Minimising the increase

- There are a few steps that clients can take to minimise the impact of increasing electricity costs when seeking a fixed-price fixed-term contract:
  - ~ Maximise retailer participation
    - Keep things simple
  - ~ Provide detailed and accurate data, including information about future changes where known
  - ~ Don't include unreasonable requests
  - ~ Keep to the project timetable
  - ~ Prepare for internal sign-off
  - ~ Make a quick decision

# Minimising the increase - making a quick decision

- Historically, retailer offers have been valid for acceptance for two weeks.
  - This is no longer possible in a volatile market.
  - Reducing validity period reduces risk premium that retailers will add into pricing
- Who needs to sign off on the contract?
  - How available are they?
  - How can we help prepare them so that when the time comes they are happy to approve the deal?
  - What information will they need?

# Post-contract review

- A lot of time goes into agreeing an electricity contract
- Vital to undertake post contract reviews into:
  - ~ Bill checking
    - \* Do billed rates match contract rates?
    - \* Are network costs passed through correctly?
  - ~ Load variance
    - \* Are sites within the permitted usage variance?
  - ~ Is the supplier delivering everything they committed to?
    - \* Reports, notifications etc.

# Key Points

- Fixed-price fixed-term contracts are the ‘vanilla’ form of agreement
- Timing of going to market is vital
- Be ready to act quickly to take advantage of market price drops
- Streamline tendering processes

# Evolution of prices

- Power Prices typically uncertain and volatile
- When deciding procurement strategy in the long term market utility don't know what prices will be in the intermediate or real time markets
- Conventional energy tends to be more expensive in markets closer to real time
  - ~ Marginal costs of production tend to be higher in spot markets than in forward or long term markets
  - ~ Conventional energy demanded closer to real time is provided by generators that have low start up time and these generators typically are more expensive than generators that require several hours to start up

# Evolution of wind forecasts

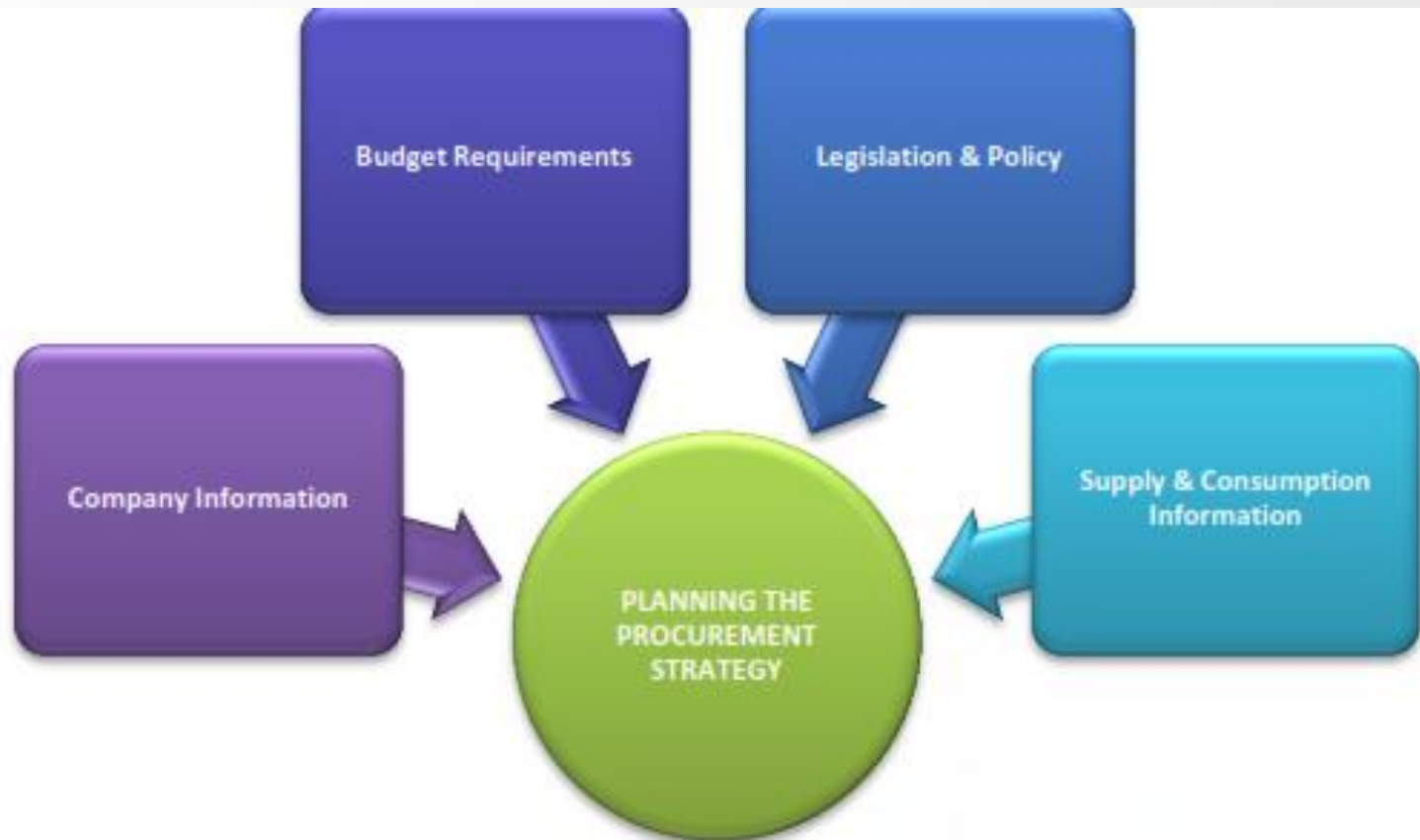
- Uncertainty about how much renewable energy will be realized in real time
- Utility company must guarantee that it procures enough generation to meet the demand despite this uncertainty



# Optimal Procurement

- Procurement problem
- Procurement decision of utility in each market can depend only on the information available to utility at that time

# Procurement



# Procurement Wish List

- Preferred principle terms
- Preferred payment methods
- Billing & transparency requirements
- Length of contract
- Fuel mix
- Volume tolerance
- Reporting & account management preferences
- Additional benefits
- Contract type:
  - Fixed or flexible commodity purchasing
  - Fixed, fully assured or pass through non commodity

# Procurement Wish List

## Fixed

Increased cost certainty

Budget set on the day

Premium on forward markets

Uniform pricing

Prices locked for the period

Protected from price spikes, no access to price drops

Easier to maintain

## Flexible

More exposure to change

Budget set at upper limit to allow trading room

Pricing more realistic to market conditions

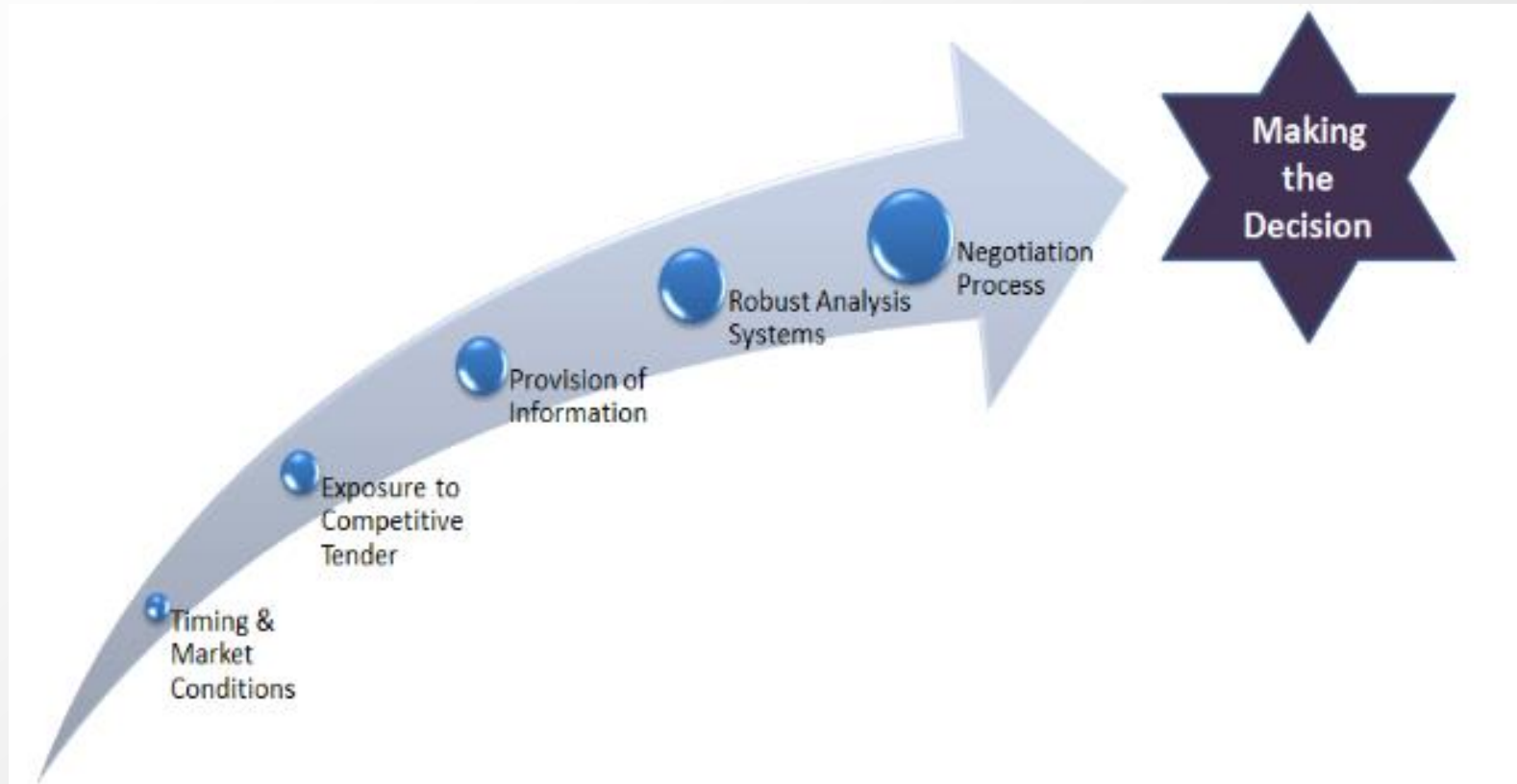
Variable pricing options

Multiple purchase decisions

Exposed to price spikes , benefit from price drops

Requires management

# Going to Market



# Risk Framework



# Risk Framework

- Defining and documenting a trading strategy
  - ~ Frequency of purchasing, volumes to be locked or remain exposed, and the hedging approach (market or budget driven).
- Capital risk position
  - ~ Absolute maximum position in which all volumes must be immediately locked if triggered
- Trade triggers to control exposure
  - ~ Documenting what monitor or buy triggers will be
  - ~ Communication activity around these triggers
  - ~ Frequency of review of these triggers
  - ~ Contingency planning if an immediate change in the market occurred

# Risk Framework

- Documenting approvers and who is authorized to trade on companies behalf
- Reporting required in two parts
  - ~ Capture trading activities and market conditions
  - ~ Financial reporting providing a view of current position against the budget
    - \* Frequency of communication and construct reports
- Market intelligence and tracking
  - ~ Insuring that adequate sources of information are being used to make trading decisions and to track the market



# Using a Broker

- There is a written contractual arrangement
- Defined key performance indicators with which the broker can be measured
- There are defined reporting & information sharing requirements
- The appropriate authorities for various activities have been agreed
- There is trust and transparency at all times with all activities they undertake
- There is neutrality, and the broker has no specific allegiances to any suppliers
- The broker has either an internal code of practice governing their activities or are subscribed to an external code of practice body. This is not essential but offer assurances that the broker will be working in the interests of their clients and in an honest and transparent manner.

# Procuring Retail Renewable Power

## Dutch Case Study

- Procuring ‘sustainability’ separately from electricity and directly from renewable energy producer
- Creating long-term partnerships with developers and operators and supporting additional renewable power production
- Entering into long-term Power Purchase Agreements
- Portfolio procurement models

# Procuring Retail Renewable Power

## Dutch Case Study

- **Grid Losses Network (GLN)**
  - ~ Reduce carbon impact of network infrastructure
  - ~ Group of infrastructure companies, incl. energy network operators, water utilities, rail infrastructure operators and data network providers
  - ~ Electricity use just over 10 TWh per year, or ca. 10% of final demand in the Netherlands
  - ~ Jointly, they invest €6 billion in their network assets every year.
  - ~ GLN aims to define joint ambitious targets around reducing energy use and losses in infrastructure, sourcing renewable energy to cover remaining energy use, and adopt circular economy procurement strategies

# Procuring Retail Renewable Power

## Dutch Case Study

### Microsoft

Microsoft has signed several 20-year Power Purchase Agreements, including a 175 megawatt Pilot Hill Wind Project in Illinois and a 110 megawatt Keechi Wind Project in Texas. This reduces the emissions associated with running the company's facilities, contributing to its sustainability goals. Moreover, Microsoft's long-term commitment to wind energy projects stimulates investment in renewable energy<sup>14</sup>. The 20-year agreements provide long-term security for investors and developers, making it easier to reach a financial close for these projects that are 'additional' and bring new renewable power onto the electricity grid.

# Procuring Retail Renewable Power

## Dutch Case Study

### IKEA

IKEA is striving to be fully energy independent by 2020, producing renewable energy equivalent to its total energy use. To achieve this, the company has committed to investing 1.5 billion euros in renewable energy projects in 2015, mainly in wind energy and solar-PV on its buildings<sup>15</sup>. In 2014, IKEA purchased a 165 megawatt wind farm in Texas and a 98 megawatt wind farm in Illinois, which will generate about 1,000 GWh of electricity per annum<sup>16</sup>. The Illinois project alone already outweighs the retailer's total energy demand from electricity and heat in the United States. IKEA's investments in renewable energy are not limited to the United States; amongst others Canada, Germany, Sweden and the United Kingdom have IKEA wind farms too<sup>17</sup>.