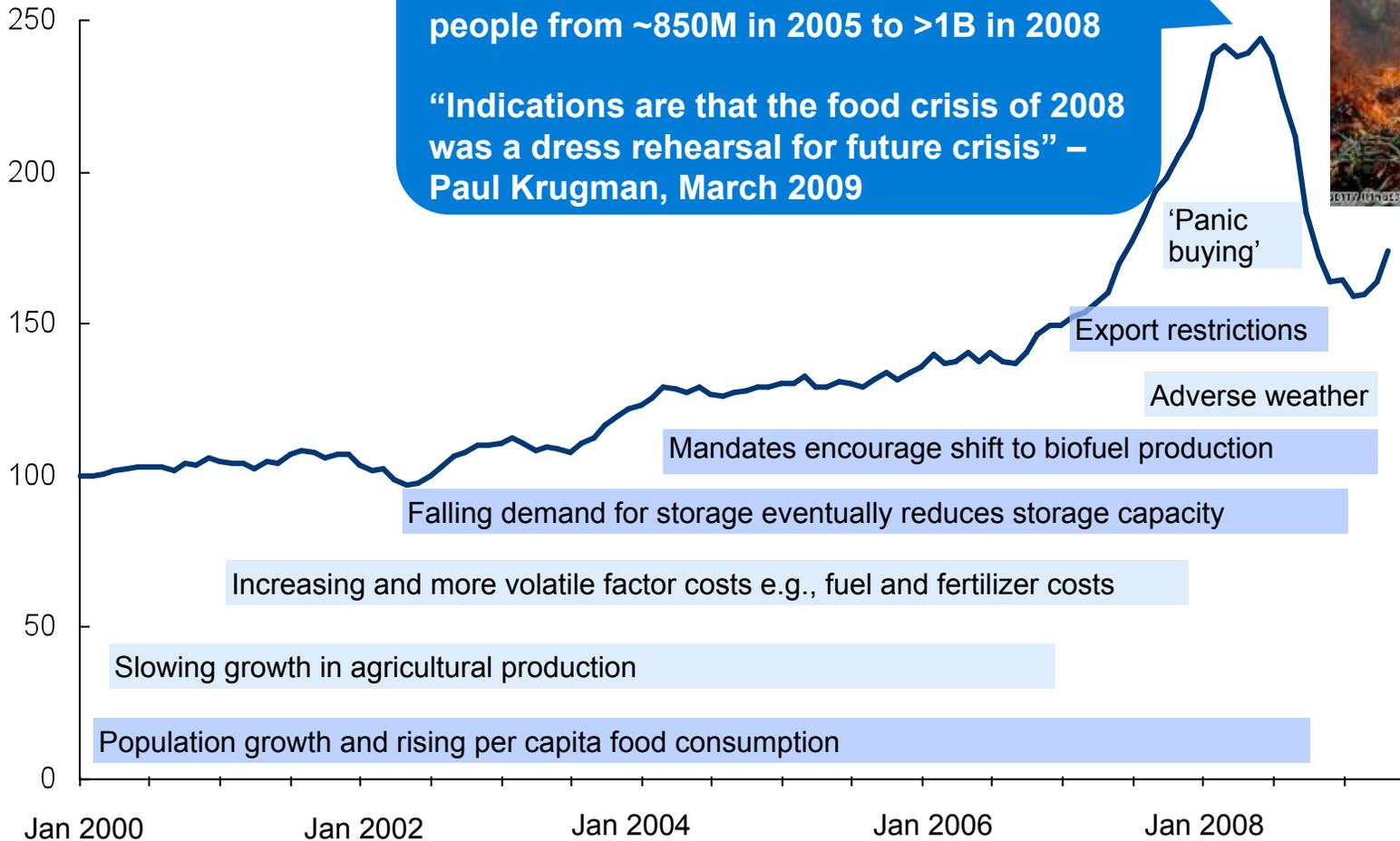


Dramatic increase in food prices and volatility driven by a confluence of supply and demand factors

- Supply factors
- Demand factors

Food price index
Jan 2000 = 100



Typical agricultural risk related issues on the agenda of our clients



Private sector

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> ▪ Impact of S/D & regulation on investments ▪ Productivity gains (R&D) ▪ LT contracting and hedging | <ul style="list-style-type: none"> ▪ Investment opportunities in storage/logistics ▪ Partnering with countries/multi-nationals to meet needs | <ul style="list-style-type: none"> ▪ Ensuring LT supply security ▪ Hedging/risk transfer ▪ Optimal sourcing strategy ▪ Partnerships/long-term contracting |
|---|--|---|

Governments

- Ensure adequate physical supply – logistics/storage
- Options to protect from food price swings (up and down) – trade and bilateral agreements
- Implementing large scale domestic agricultural transformation

Trans-national entities

- Co-ordinate multiple parties in creating a region and country-specific strategies for agricultural development
- Creating partnerships with private parties to identify win-win solutions for Ag development

.... but solutions are not always easy

- ✓ Fact-based understanding of fundamentals of risk drivers
- ✓ Need for integrated end-to-end perspective – often actions lead to unintended results
- ✓ Adapt analogies from other commodities

Several key interrelated elements to food security risk

Food security defined as

- **Having regular access to food providing a nutritionally sufficient and appropriate diet**
- **At an affordable price**

Global production

How can we globally produce sufficient food quantity to nourish the population?

Local food availability

How can specific regions/ countries ensure sufficient local supply at the time needed (logistics?)

Global price trends and volatility

How will global food prices evolve in the long and short term (trend and volatility)?

How can countries, consumers, and producers respond to the long term trend as well as short-term global food price volatility?

Local consumer prices

Do (regional) consumers have the ability to purchase food at an affordable and stable price ?

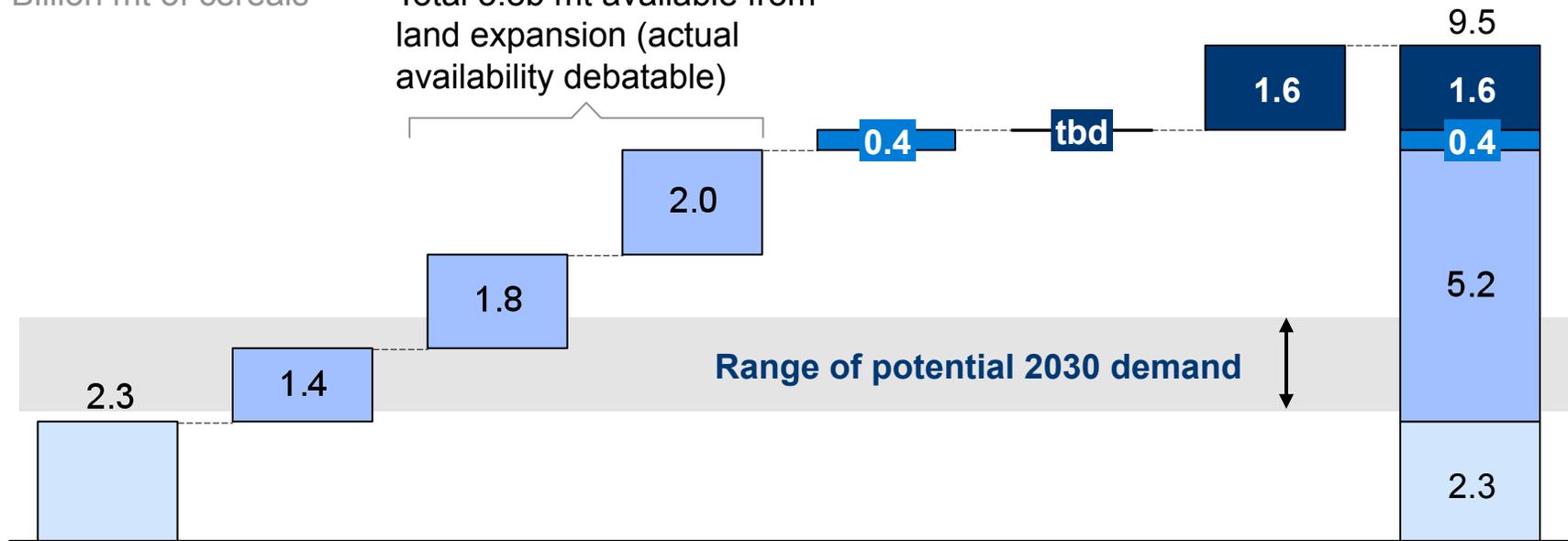
Physical potential today to produce 4x more food... massive challenges to unlock

- Current production
- Supply-side improvements
- Demand-side improvements
- Technology improvements

Production potential

Billion mt of cereals

Total 3.8b mt available from land expansion (actual availability debatable)



Current production

Yield upside on current crop land¹

Land upside with current yield²

Upside from high yield on new land

Reduction of waste and food loss

Additional potential due to irrigation

Technology improvements³

Theoretical potential production

1 Yield upside is estimated as the difference between current yield and IIASA estimated potential yield, where this is higher

2 Land upside is based on IIASA estimated available land, reduced by 30% to account for needs in infrastructure, wood land etc.

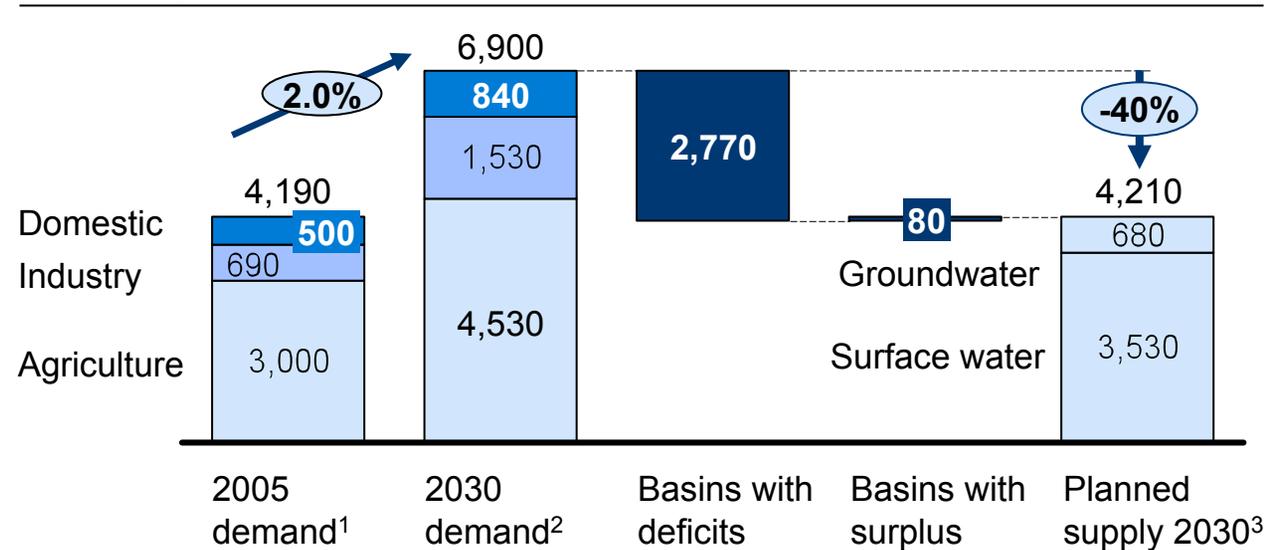
3 Technological improvements are based on a IIASA maximum yield increasing by 1.2% a year in developed countries and 0.6% elsewhere

... massive challenges to achieving this potential

- Key constraints**
- Water availability
 - Climate change
 - Degradation of arable land
 - New land with higher logistics costs
 - Competing use of food (e.g. fuel)
 - Increasing dependence on expensive fuel and fertilizer

Example: Water demand and supply balance and its drivers, 2030

Billion m³/year



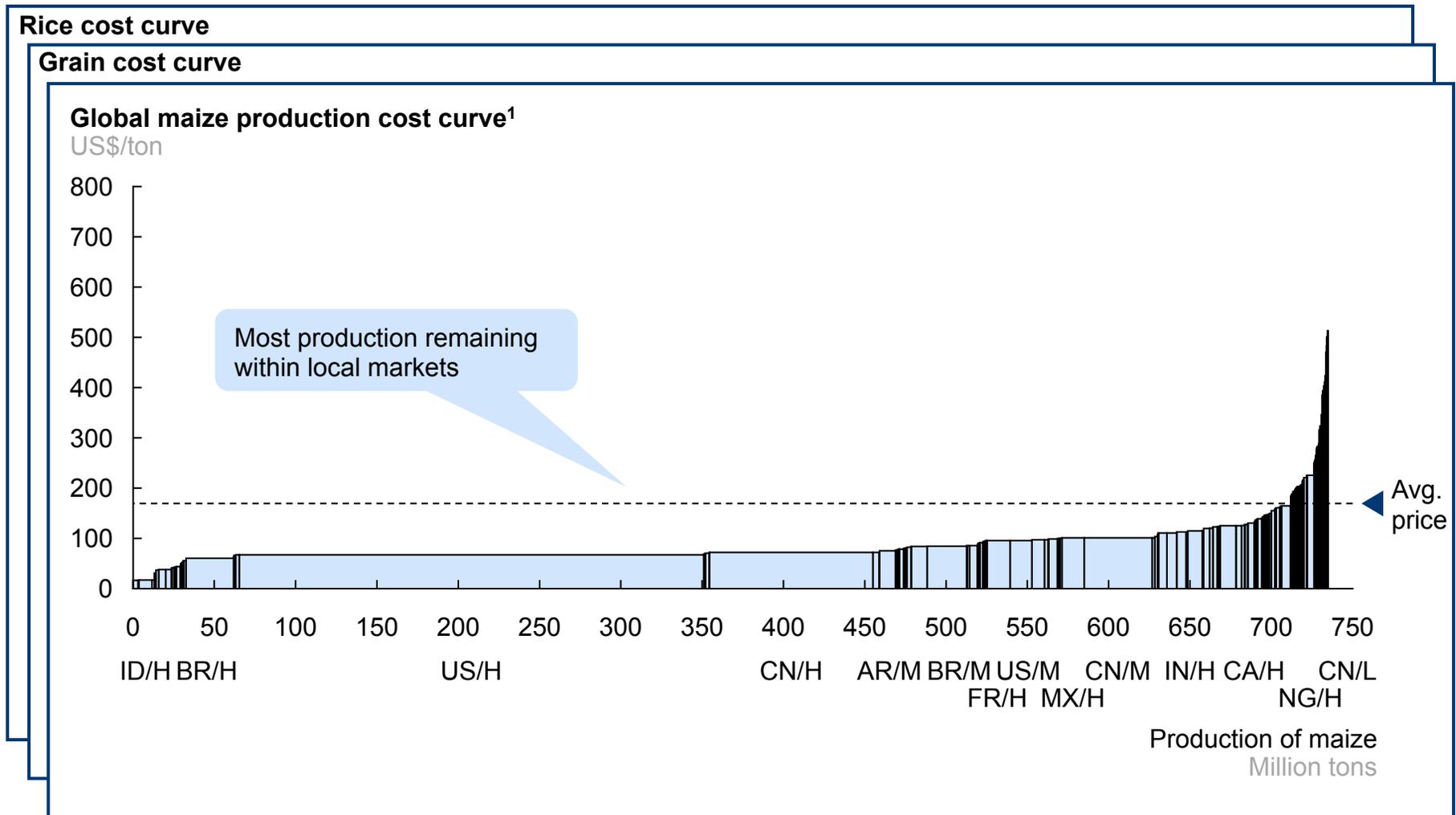
1 Demand in 2005 based on inputs from IFPRI

2 Demand in 2030 based on frozen technology and no increase in water efficiency after 2010

3 Supply at 90% reliability and includes infrastructure investments scheduled and funded through 2010; supply in 2005 is 4,081 billion m3 per year; supply in 2030 under projected technological and infrastructural improvements equals 4,866 billion m3 per year; net of environmental requirements

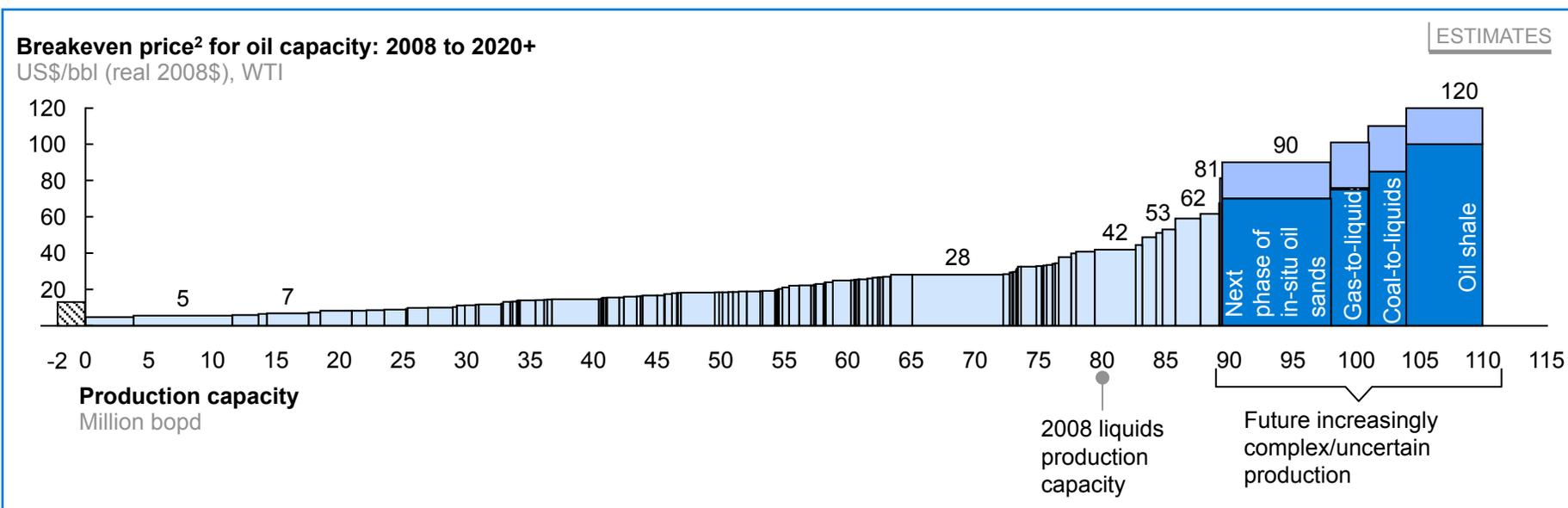
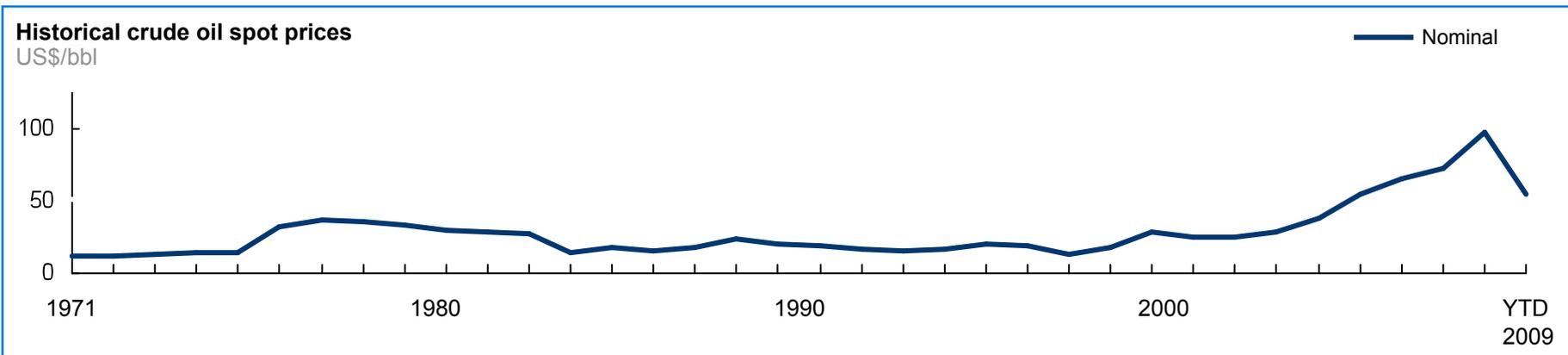
The overall food supply curve is getting steeper ...

ILLUSTRATIVE



1 Assumptions on new production e.g. Brazil, Argentina, Ukraine can expand production by 20% and US by 15% with cost increases of less than 15%

Oil analogy: Steepening of cost curves together with supply/demand disruptions contribute to increase in prices and volatility (and recurrence)



1 1861-1944 U.S. Average, 1945-1983 Arabian Light posted at Ras Tanura, 1984-2008 Brent dated, YTD Aug 2009 adjusted with US GDP deflator

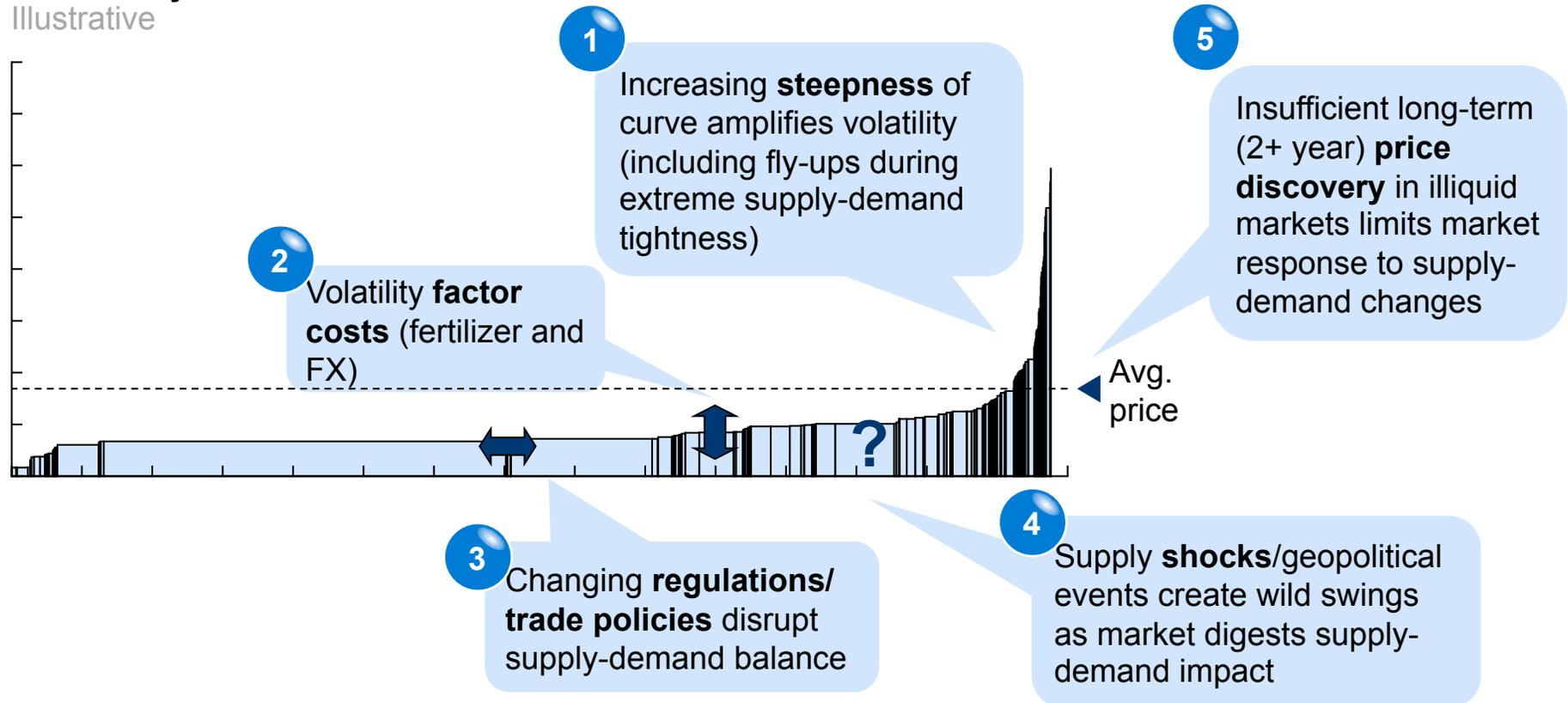
2 Assumes an IRR of 10% for new capacity additions and cash break-even for existing production capacity

Cost curve analysis provide a framework for understanding the impact of drivers of price volatility

ILLUSTRATIVE

Commodity cost curve

Illustrative



- Other factors to consider**
- 6** Regional dynamics and local supply/logistics constraints
 - 7** Fly-ups from **speculation** and **panic buying** when demand moves to steep end of costs curve

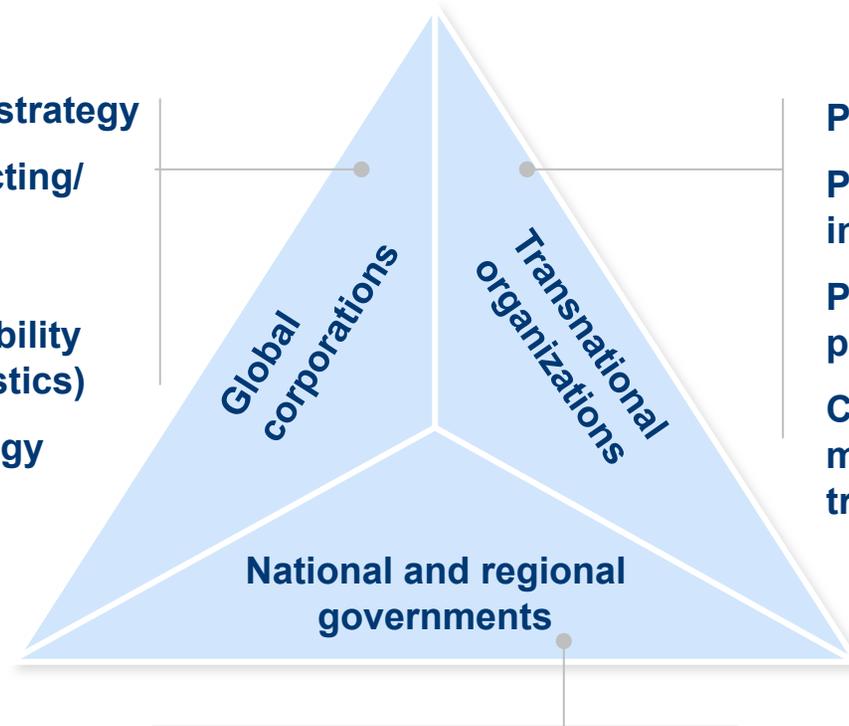
Different stakeholders approach the issues through different angles

Optimal sourcing strategy

Long term contracting/
partnerships with
producers

Supply chain flexibility
(e.g., trading, logistics)

R&D and technology
investments



Policy advocacy

Provide access to
information and research

Promote public/private
partnerships

Create liquid futures
markets to (physical and
trading)

Domestic production growth strategy

Overseas land investment

Bilateral and long-term commercial agreements

Investments in storage and logistics

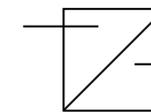
Regulation, tariffs, and subsidies



Multinational food retailer developing win-win strategies to address supply security

PRIVATE SECTOR EXAMPLE

Client contribution (\$M)



Smallholder farmers benefited (000's)

- Best opportunities
- Moderate opportunity
- Minimal opportunity

Model	Cotton	Coffee	Bananas	Sugar	Soy
1 Switch sourcing to Africa	\$5 120	\$5 60	\$5 10	\$0 1	- 10
2 Partnership with long term contract	\$30 200	\$10 130	\$20 20	\$2 5	- 20
3 "Contract farming" leverage world class sourcing	\$80 500	-	-	\$1 1	-
4 Socially responsible "branded" products	\$30 150	\$5 20	\$2 1	\$1 5	\$1 7

Integrated sourcing strategy triples the income of 5 million small-holder farmers

...while increasing corporate bottom line by \$100s of millions

Country strategy involving multiple measures to improve own food security

COUNTRY EXAMPLE

	<u>Lever</u>	<u>Concept/description</u>
Farming and origination	1 Overseas land investment (but high logistics cost)	<ul style="list-style-type: none"> Own or manage farmland in other countries to guarantee domestic supply
	2 Domestic farming yield	<ul style="list-style-type: none"> Improve local production yield/output to decrease import dependency
Import and trade	3 Commercial agreements, e.g. long-term contracts tenders	<ul style="list-style-type: none"> Agreement to buy a certain quantity at a pre-determined price
	4 Foreign treaties, e.g. bilateral agreements	<ul style="list-style-type: none"> Agreement with other sovereign entity to ensure supply under conditions of scarcity
Logistics and storage	5 Strategic physical storage and logistics network locally	<ul style="list-style-type: none"> Strategic reserves of food with regular distribution and replenishment
	6 Create food hub	<ul style="list-style-type: none"> Establish position of country as a food processing hub
Domestic market	7 Private sector incentives	<ul style="list-style-type: none"> Liberalization of local agribusiness industry to unlock profit potential and boost growth
	8 Regulations, tariffs and subsidies	<ul style="list-style-type: none"> Government interventions to ensure stable supply and affordable prices

Experience from other commodities suggest several levers which need to be tested and will require global collaboration

Volatility driver	Example action from other commodities	Potential applicability to Ag?
Supply-demand tightness	<ul style="list-style-type: none"> Subsidize demand reduction (e.g. hybrid car incentives) Incent investments to support build out (e.g. transmission grid build out for power) 	<ul style="list-style-type: none"> Global “grain bank”/ multi-country strategic stockpile Producer loans/ return guarantees Logistics hubs
External disruptions	<ul style="list-style-type: none"> Grow buffer capacity (e.g., OPEC spare capacity, Strategic petroleum reserve) Build storage/logistics infrastructure (e.g gasoline logistics network) 	
Poor price discovery/ market signal	<ul style="list-style-type: none"> Develop more liquid longer term futures markets (e.g., 1980s Brent oil) Add liquidity to existing markets (e.g., NYMEX gas since 2005) 	<ul style="list-style-type: none"> Build out longer term Ag futures markets (external guarantees) Create visibility across value chain Market maker role to increase liquidity/ reduce “perceived risk”
Speculation/ panic buying	<ul style="list-style-type: none"> Enhance publically available market information (e.g., EIA, FERC role in deregulated power markets) Trading/trader position limits 	<ul style="list-style-type: none"> Coordinated research/ information dissemination strategy Promotion of positive market trading regulation