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GLOBAL E&P SUMMIT

Harvesting the Low-Hanging Fruit

Revitalizing Mature and Marginal E&P in a Lower Price Environment

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There is considerable potential left in "marginal"

Reserve replacement sources:

- Conventional large target exploration
- Exploration and development of assets with higher resource impact but higher breakeven thresholds (technological frontiers: deepwater, HPHT, tar sands, tight, shale, etc.)
- Better/enhanced field development practices for better characterization and recovery efficiency (new 3D, IOR, EOR, 4D, etc.)
- Transformational M&A

- Exploration and development of small or marginal fields, as tie-backs to larger fields with infrastructure or using "virtual" infrastructure (trucks, barges, "virtual pipelines" for CNG)
- Rehabilitation of mature conventional or unconventional fields (redevelopment, EOR)
- Field life extension by reduction of the economic limit
- Bolt-on asset acquisitions

Opportunities that under current conditions appear sub-economical, for various reasons:

- Perception of “low materiality” (by definition, relative to the observer’s point of view and its internal corporate financial hurdles)
- Higher asset age and degree of depletion
- Lack of attention from the Operator due to low relative importance vis-à-vis the “core” assets in its portfolio
- Located in environmentally/socially sensitive areas, or with poor public safety
- Stranded in remote areas without adequate evacuation infrastructure or no immediate/clear monetization schemes
- Typically have reserves/resources accounted for as Probable, Possible, Contingent, Technical or Prospective, which will not be timely migrated to Proven Reserves and transformed into Production

Statistically and geologically, there are ample conventional resources to be discovered and recovered from smaller, mature or "economically marginal" assets

If their shortcomings can be somehow addressed, they may offer the following advantages:

- Conventional technologies and equipment (off-the-shelf)
- Lower costs ➔ lower breakeven prices
- Lower geological and extraction risks
- Short-term response. May fill-in gaps while major projects come online
- Natural to the experience and capabilities of small and medium independent OilCos
- Good for incubating local independent startups

The Government has at its reach some levers that can influence the economic equation of an asset, and nudge it positively

- Obviously, the economic equation is dominated by variables outside of the Government's control: scale of the resource, productive behavior, price of HCs, physical finding, development and lifting costs
- However, there are some levers it can actuate:

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Governments have multiple levers potentially at their disposal (1/2):

Information	Make it widely and cheaply available
"Food Chain"	Promote the participation of many smaller actors in the local HC market. Facilitate agile A&D transactions
Asset Offerings	Hold "marginal" field tenders, discriminating the quantitative prequalification criteria to suit the target audience, properly designing the bid variables and their relative weights
Infrastructure	Alleviate infrastructure bottlenecks. Stimulate or invest in midstream to help monetization, stimulate local thermal generation

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Governments have multiple levers potentially at their disposal (2/2):

Effective Price	Revert negative price interventions or subsidize domestic prices. *Personally, I prefer to let market prices be, come rain or sunshine*
Land Management	While respecting contract sanctity, incentivize dominant incumbents to sell, farmout or contract (e.g., incremental production) assets for which they don't have specific investment plans
Contractual / Fiscal	Adequate contractual models for marginal assets (licenses or PSCs) General or discretional reductions in government take (royalty or tax holidays) Provide fungible tax credits
Financial	Promote/seed investment funds for micro-independents, acting as incubators

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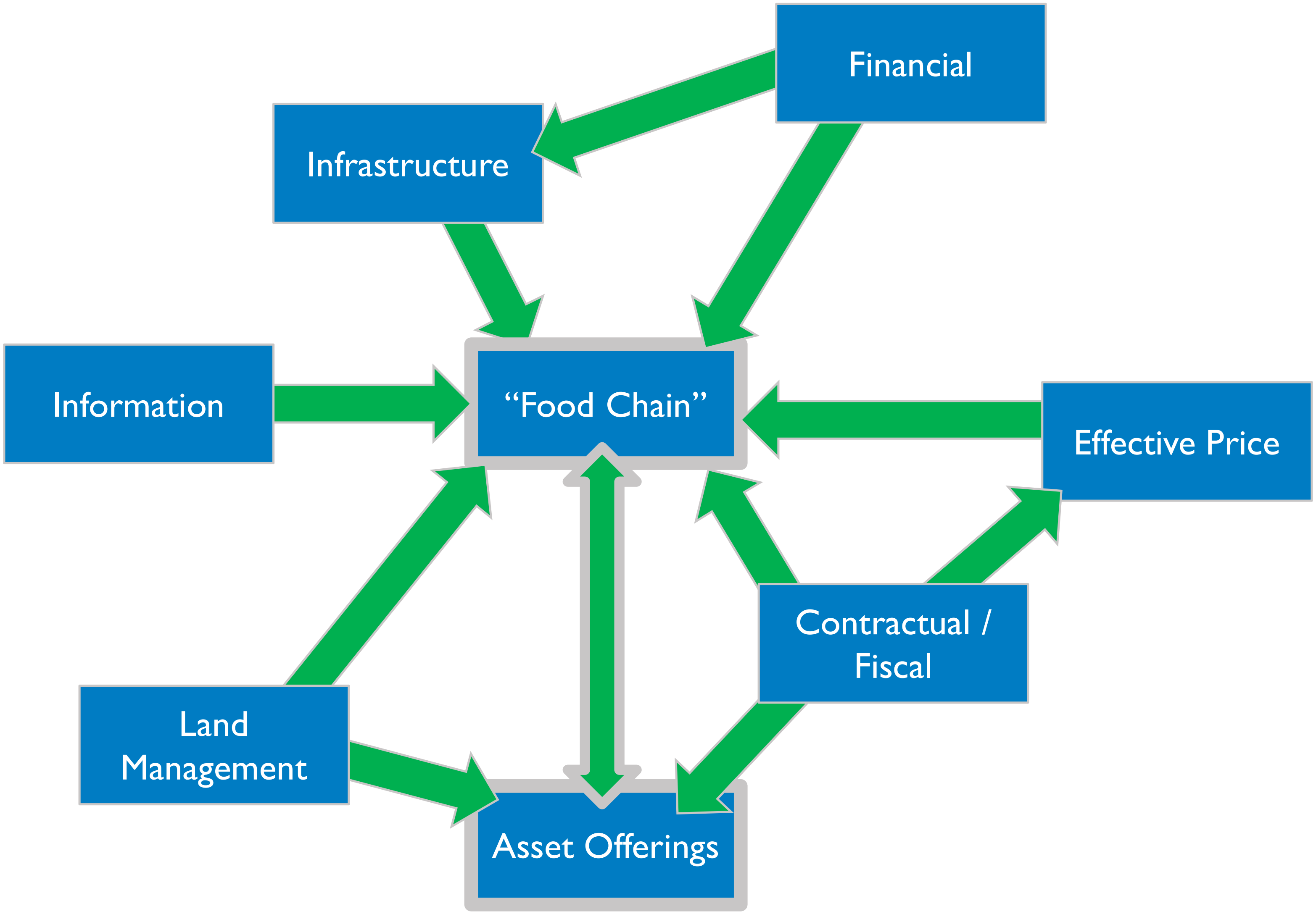
Many of these levers feedback and reinforce each other (virtuous cycle)



An open platform with easy and cheap access is paramount to stimulating transactions

- Information should be public, after a reasonable period:
  - Seismic and well logs
  - Well production history
  - Scout tickets / completion charts
- They allow any company to analyze and estimate the value of an asset independently, even before approaching the incumbent
  - A first approach with a tentative number in hand, is much more effective

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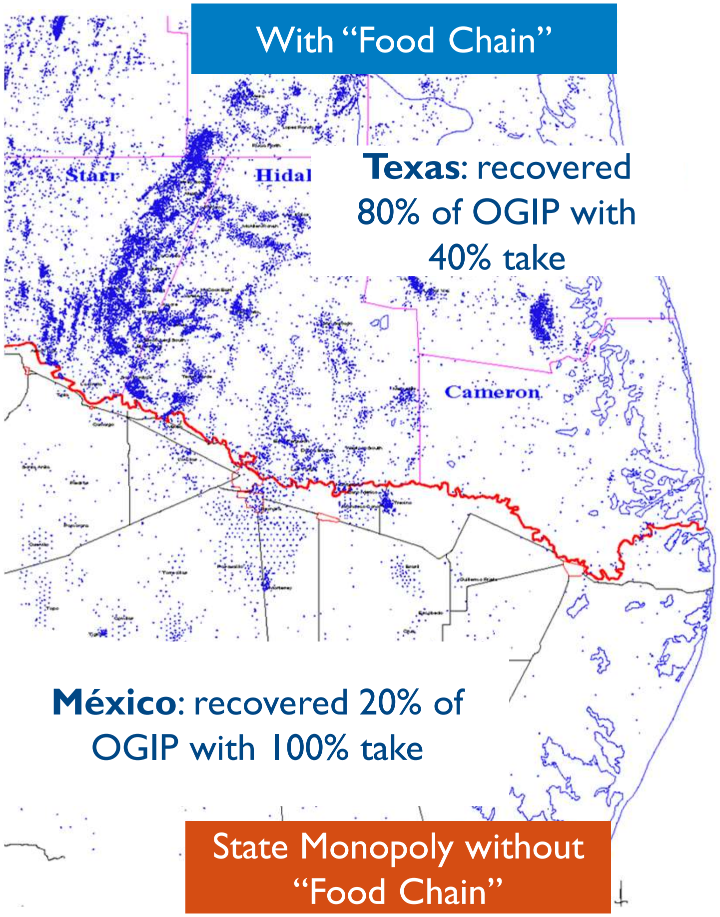
"Food Chain" ➔ A&D market ➔ much more drilling activity

Tex-Mex Anomaly (Texas Dist. IV – Burgos) - 2002 snapshot



With "Food Chain"

Texas: recovered 80% of OGIP with 40% take

- 54,000 km2
- 83,639 wells drilled
- 67.7 Tcfg cum (0.809 Bcf/well)
- 3.6 Bcfg/d

México: recovered 20% of OGIP with 100% take

State Monopoly without "Food Chain"

- 50,000 km2
- 4,881 Wells drilled
- 8.1 Tcfg cum (1.659 Bcf/well)
- 1.1 Bcfg/d

Assets get transacted from large companies to medium ones, and then to smaller ones

Which Government captured more Rent?

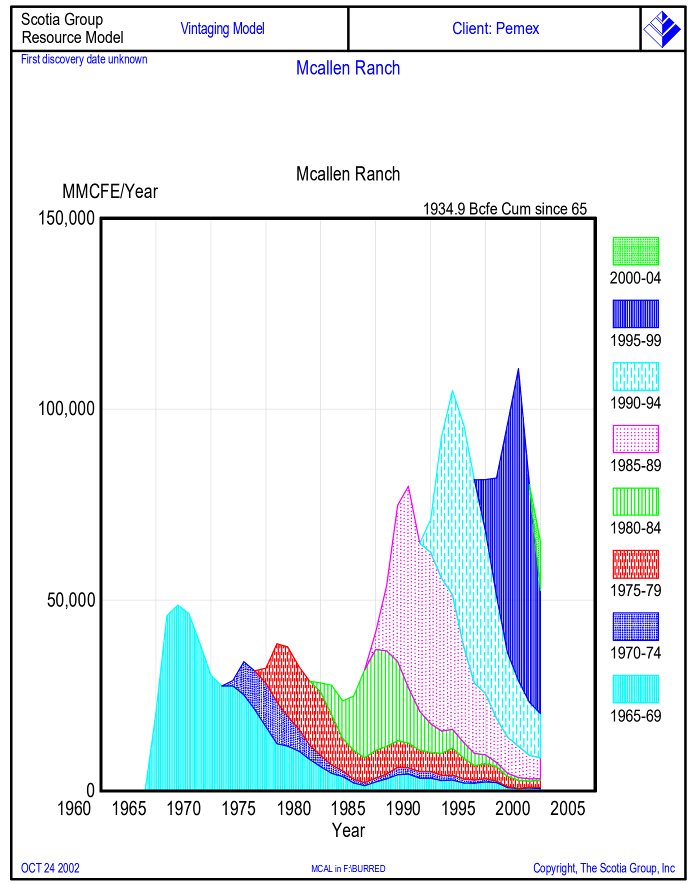
Source: The Scotia Group

An active A&D market increases drilling activity

- Reserve growth can yield results comparable to new exploration
- Change in ownership results in new drilling campaigns
  - Risks and hurdles are lower
  - Response is immediate
- Naturally, eventually the field will reach diminishing returns. Exploration continues to be essential

In this asset, seven successful drilling campaigns by seven different owners, before hitting the wall

ILLUSTRATIVE



Source: The Scotia Group

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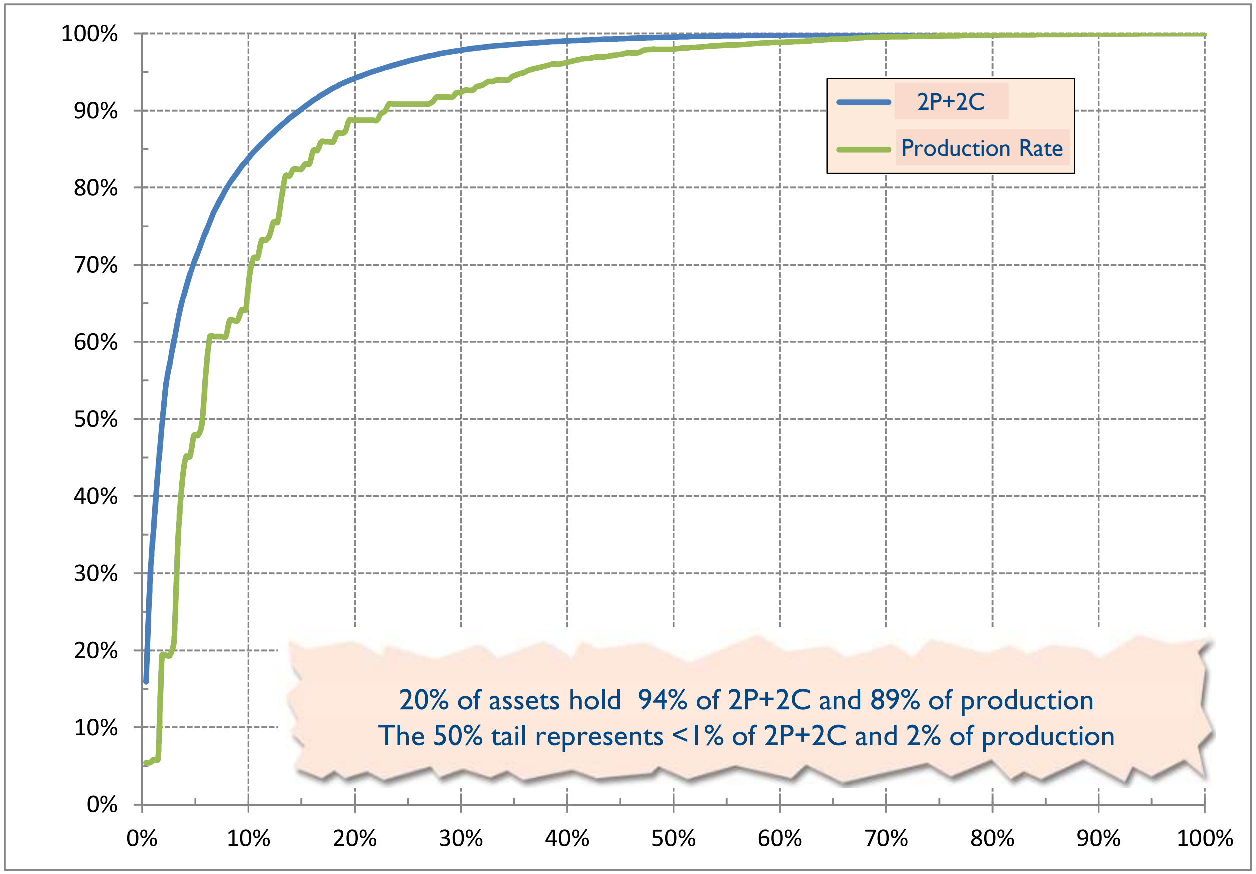
A large/dominant company may want to rationalize its portfolio and do away with mature/marginal assets

A crumb for Milord, a feast for the peasant



ILLUSTRATIVE

The Economic Field Size has a significant effect on basin reserves

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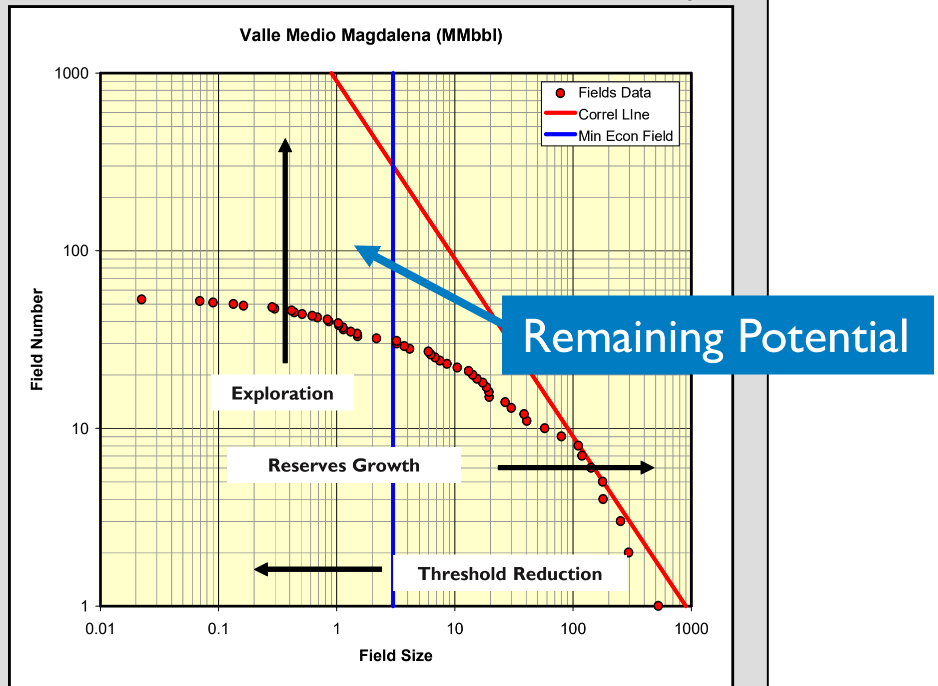
- A basin's remaining reserve potential depends on the field size economic threshold and the production economic limit
- The large fields are normally discovered first
- The implication is that if:
  - (a) mature field lives are extended,
  - (b) marginal prospects or fields are made commercial by better contractual and fiscal terms,
  - and (c) micro-independents emerge and focus on discovering or revitalizing small fields,
- ➔ ***Mature basin reserves may grow again***

Figura 1



Estimated Undiscovered Resources

Field Size Range	Number Modeled	Number Disc.	Number Undisc.	EUR Modeled	EUR Disc.	EUR Undisc	Percent Undisc.	Avg Undis EUR
0.01 to 0.05 MMbbl		1		0.0	0.0			
0.05 to 0.1 MMbbl		2		0.2	0.2			
0.1 to 0.5 MMbbl		6		1.7	1.7			
0.5 to 1.0 MMbbl		5		3.5	3.5			
1.0 to 5.0 MMbbl	121	12	109	463.7	25.2	438.6	95%	4.0
5 to 10 MMbbl	90	5	85	626.3	35.2	591.2	94%	7.0
10 to 50 MMbbl	72	12	60	1,468.7	263.8	1,204.9	82%	20.1
50 to 100 MMbbl	9	2	7	649.5	137.2	512.3	79%	73.2
100 to 500 MMbbl	7	7	0	1,546.1	1,279.3	266.8	17%	
500 to 1000 MMbbl	1	1	0	900.0	528.4	371.6	41%	
1 to 5 Billion bbl								
>5 Billion bbl								
Totals	300	53	261	5,659.8	2,274.5	3,385.3		

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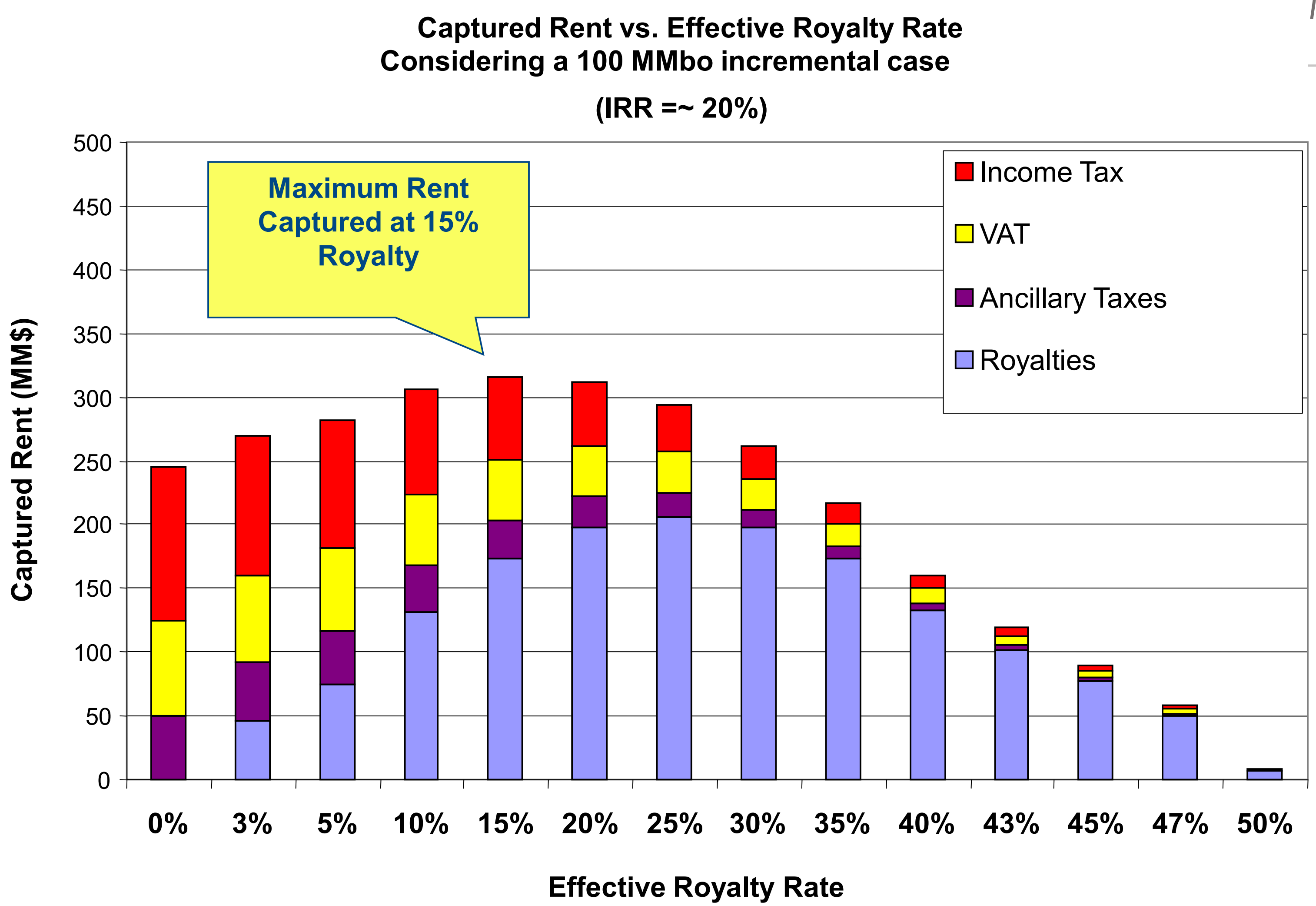
Higher Government Take does not imply higher Rent capture (1/2)

ILLUSTRATIVE ~2004



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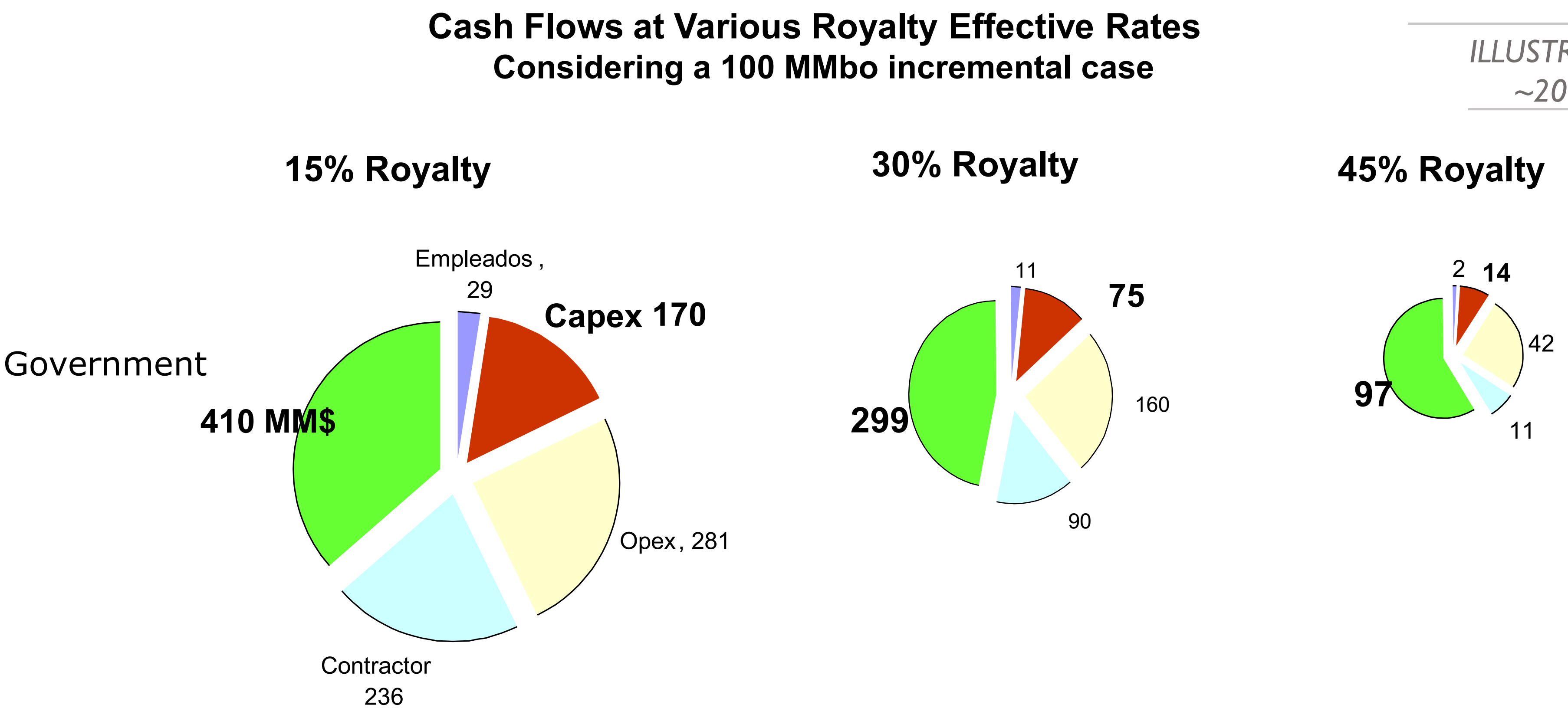
Higher Government Take does not imply higher Rent capture (2/2)

ILLUSTRATIVE
~2004



Design for purpose the contractual terms and the tender mechanism

1. Start with a Competitivity Study, comparing contractual, fiscal and regulatory frameworks with those of other countries competing for the same investments
2. Design a contractual/fiscal system
   a. Adapted to the risk level
   b. Competitive
   c. Viable legally and politically. If it requires legislative change, it must be properly lobbied
   d. Present draft model to investors and be open to their feedback. To listen does not necessarily imply to acquiesce
3. Design a Tender Process that:
   a. Attracts the right O&G investor population; those with the necessary and sufficient operational and financial capabilities for the project scale
   b. It must be transparent and simple (no more than two bid variables), which must be weighted so that the investment commitment dominates, not the hypothetical risk capture (*"60% of something is much better than 90% of nothing"*)

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Maintain a steady rhythm of offerings to the right target audience

- Design bidding variables that incentivize **Investment** over Government Share or Take (e.g., relative weights 60/40)
  - *Investment commitments offer more flexibility than work commitments*
- Maintain **strict qualitative prequalification criteria**, but relativize quantitative operational and financial criteria, adjusting them to the target audience (small independents and startups)
  - *CVs of senior management and operational staff, demonstrating industry and O&G asset operation experience*
  - *Certificates of incorporation or formation, legal representatives and by-laws*
  - *Comprehensive organization chart detailing the chain of control of each participating entity, down to natural persons*
  - *Joint venture agreements, consortia, future partnership agreements, etc.*
  - *No participant is in bankruptcy, from reorganization to liquidation*
  - *Not allowing or having allowed its operations to be used as cover foe money laundering from criminal activities, including corruption, terrorism or tax evasion*
  - *Commitment to establish a local branch, with a Legal Representative*
  - *The Operator must hold at least 30% participation in the consortium*
  - *Commitment guarantees supported by Letters of Credit*

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Bad example of bid round, rewarding gaming

- 90% weight to *Government Share of Profit Oil*, and 10% to *Additional Investment*
- In the hotly contested Block 7, Sierra et al, with a marginally higher profit Split beat a much larger exploration investment by Statoil (now Equinor)

		Shallow Water Exploration Blocks													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Minimum Acceptable set by Hacienda	Gov. Profit Oil Share	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*25%*	*40%*	*40%*	*25%*	*25%*	*25%*	*25%*
	Additional Investment	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
		No Bids	***Valid Bids***	*Invalid Bids*	*Invalid Bids*	*No Bids*	*Invalid Bids*	***Valid Bids***	*No Bids*	*No Bids*	*No Bids*	*No Bids*	*Invalid Bids*	*No Bids*	*No Bids*
	Anadarko														
	Cobalt														
	Eni-Casa							57% 20%							
	Hunt		54.55% 5%					65.11% 15%							
	Murphy-Petronas			35% 5%	35% 5%										
	ONGC						20% 5%						20% 5%		
	Pan American Energy							27.26% 6%							
	Sierra-Talos-Premier		**55.99%** **10%**					**68.99%** **10%**							
	Statoil							65% 86%							

Source: Plata Energy analysis of CNH information

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Tax Credits in USA have been very effective in stimulating the "food chain" and A&D

USA fiscal incentives (historical)

- They lowered the economic field size threshold
- They were applied to anything "marginal" at the time: shales, Devonian gas, coal methane, tight gas, etc.
- A tax credit is much more powerful than a tax deduction
- In 2004, the credit was of $6.75/bo, and the phasing-our ceiling was in the $50.60-63.50/bo range for the average U.S. oil price. 2004 was the first year it got close to the ceiling
- A $6.75 tax rebate for every barrel sold could be credited or sold to a third party. They were fully fungible; transferable and applicable to any type of taxable income of any person. There was even a market for them and their derivatives

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If there is no international financing, or if local financing is too onerous for micro-independents, consider an incubator fund

Colombia (historical)

- Closed fund created in 2005
- Seed capital: $60 MM (42% by NOC Ecopetrol, 58% local private investors)
- A seasoned expert panel (geologist, geophysicist and engineer) evaluated proposals and provided advice on exploration strategy and process
- Portfolio balanced between low risk exploration (50-70%) and incremental production or field rehabilitation projects with quick monetization (30-50%)
- Fund participated as equity, convertible debt or mezzanine for stable cash flow. There was an exposure cap and a maximum 50% capital weight per project
- Establish credibility and then raise from international investors

Conclusions

In a lower price environment, there may be significant remaining potential in currently sub-commercial conventional prospects and fields with:

- Low geological or lifting risk
- Low technical complexity and moderate costs
- Often close to infrastructure, or to fields with evacuation pipelines, or amenable to trucking or barging
- Sort-term response

The Govt. has some tools or levers to pull to incentivize the harvest of the "low hanging fruit", to supplement the response of the more material projects with higher complexity, costs, breakeven and lead times

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