UNITIZATION

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Outline of Presentation

1. Introduction to Pre-Salt
2. Brazil Petroleum Law History
3. New Pre-Salt Regime
4. Unitization of Pre-Salt
5. Unitization Internationally
Outline of Presentation

1. **Introduction to Pre-Salt**
2. Brazil Petroleum Law History
3. New Pre-Salt Regime
4. Unitization of Pre-Salt
5. Unitization Internationally
Why are we discussing this topic? (1)

- Recent deepwater pre-salt discoveries
  - “A gift from God,” former President Luis Inacio Lula da Silva
- Massive pre-salt area: 800km x 200 km
- About 300 km offshore
- Deepwater: over 2,000m water + 5-7,000m below seabed
- Salt layer above reservoir up to 1-2000m thick
  - Seismic problems
  - Drilling problems
- Perhaps 50+ billion barrels of light, sweet oil
  - A few dry holes have been drilled
  - Thus, pre-salt is not a single giant homogenous reservoir
Why are we discussing this topic? (2)

• $400+ Billion investment by 2020
  – Petrobras alone is planning to invest about $225 billion over the next 5 years (most in pre-salt)
  – Includes 65 deep-water rig orders to be operational by 2020
    • 39 by 2014
    • 15 have been delivered

• Brazil will go from net importer to net exporter of oil
  – Brazil becomes a top-6 producer from about 25th today & largest non-OPEC producer

• Players include: Petrobras, OGX, Vale do Rio Doce, Total, Anadarko, Sk Brasil, BP, IBV, Shell, Inpex, Ecopetrol, Maersk, Repsol, Statoil, Petrogal, Sonangol, BG, ExxonMobil, Hess, Woodise, Chevron
Why are we discussing this topic? (3)

• Risks:
  – Technically and commercially challenging
  – Environmentally challenging due to oil spill risk
    • November 2011, oil spill on Chevron pre-salt platform
  – IOCs may believe political & corruption risk is high
  – Relatively low geologic risk due but reservoir sizes could require massive unitizations

• Unresolved dispute over revenue sharing between federal and state governments
Petrobras Production Highlights

Total Production

- Produção de Petróleo Brasil
- Produção de Gas Brasil
- Produção Petróleo Internacional
- Produção de Gás Internacional
- Deepwater Basins
Deepwater Drilling

Shell-Noble Bully I
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Brazil Petroleum Timeline

- 1983: Law 2.004 gives Petrobras monopoly in Brazil
- 1988: Constitution gives Petrobras monopoly in Brazil
- 1995: Constitutional amendment ends Petrobras monopoly
- 1997: CNPE established to address policy; ANP established to regulate Petrobras and investor IOCs through concessions
- 1998: 397 Concession Contracts issued to Petrobras
- 1999-2005: Seven competitive bid rounds
- 2006: Round 8: suspended
- 2007: Round 9: 41 Blocks removed in potential Pre-Salt area
- 2008: Round 10: offered only onshore Blocks
- 2010: New Pre-Salt & Strategic Area Regime
Brazil Constitution

• HG Constitution
  – E.g., Brazilian Const., Arts. 20(v)&(ix) & 177(i)-(iv) & §1º
    • 20(v)&(ix): Reserves all petroleum, both onshore & offshore, to federal government
    • 177(i)-(iv): Declares federal monopoly on exploration, exploitation, refining, import, export, & transport of petroleum
    • §1º permits development by public (Petrobras) or private entities through contracts with federal government
Brazil Hydrocarbon Law

  - Art. 1: Declaration of national energy policy & objectives
  - Art. 2: National Council of Energy Policy
  - Art. 3: Restates federal ownership of onshore & offshore petroleum
  - Art. 4: Restates federal monopoly over exploration, exploitation, refining, import, export, & transport of petroleum
  - Art. 5: Authorizes regulation of & contracting with private companies organized & headquartered in Brazil
Brazil Hydrocarbon Law

• HG Hydrocarbon Law: Brazilian Petroleum Code, Law NR.9.478/97
  – Art. 7: Establishes ANP, administrative & regulatory agency, under MM&E
    • Art. 21: Empowers ANP to administer onshore & offshore petroleum resources
    • Art. 23: Empowers ANP to issue concession contracts by tender in blocks defined by ANP
  – Art. 24: Provides for concession contracts with an exploration phase (includes appraisal & determination of commerciality) & a production phase (includes development)
  – Art. 27: addresses unitization
Brazil Hydrocarbon Law

• Unitization Law 9478/97, Art. 27: Revoked for PSCs.
  – For fields extending over adjoining blocks operated by different concessionaires
  – Parties involved shall agree on the unitization of the production
  – If no agreement within maximum period established by ANP, then ANP shall, based on an arbitral decision, shall determine how to equitably share rights and obligations and allocate production based upon applicable legal principles
Brazil Hydrocarbon Law

- **HG Hydrocarbon Law**: Brazilian Petroleum Code, Law NR.9.478/97
  - **Art. 26**: Concessionaire
    - Obliged to explore at its own expense & risk
    - If successful, is obliged to develop & produce
      - Development plans must be approved by ANP
        » Plan is deemed approved 180 days after submission if ANP does not respond
  - **Art. 29**: Concession may be transferred to party who meets technical, economic, & legal requirements with ANP approval
    - ANP may require performance guarantee
Brazil Hydrocarbon Law

• HG Regulations or Model Instrument
  – Model Concession Agreement 2008, Exploration, Development & Production of Oil & Natural Gas Between ANP & Contractor
Brazil: General Fiscal Terms
Decree No. 2705, 3 August 1998

• Signature bonus (bid)
• Royalty (10%)
• “Special Participation” variable on profitability
• Retention Fees (indexed fees established in bid notice & paid each year per square km)
  – Exploration Phase (double for an extension)
  – Development & Production Phase
  – Production Phase
• Onshore 1% landowner “participation”
• Federal, State, & Municipal taxes (as applicable)
• Government take is estimated between 55% and 68%
Brazil: General Fiscal Terms
Decree No. 2705, 3 August 1998

• “Special Participation”—basically a net-profits levy
  – “Extraordinary financial compensation” for “great volume of production or great earnings”
  – Formula varies for onshore, shallow offshore, deep offshore
  – Tied to production rates & year of production
    • % rate of participation kicks in at lower production intervals onshore, higher for shallow offshore, & highest for deep offshore
    • % rate of participation kicks in at lower production rates in second, still lower rates in third, & still lower rates in fourth year
    • % rates range from 0% to 40%
  – Losses in one year may be carried forward to offset participation in following year
  – Many more details, including revenue sharing with states within Brazil
Brazilian Concession Contracts

• Increasing “local-content” requirements after 7th Bid Round
• Term up to 34 years: Exploration (3 to 7 – divided in 2 periods) and production phases;
• Minimum Exploratory Programs (PEM);
  – First Exploratory period: returning the area or undertaking the commitment to drill an exploratory well;
  – Second Period of Exploration with additional commitments;
• In the event of a discovery – evaluation of commerciality
• Concessionaire submits Development Plan for ANP approval
• Production Period (maximum term of 27 years).
Brazil Concession: Government Take

Gross Production

- Government Royalty
- IOC's Taxes
- Perhaps Special Participation

Production Net of Royalty

- IOC’s Production Net of Gov’t Take
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Recent Pre-Salt Laws

• Law 12.351/10 Mandates PSCs for the pre-salt area and “strategic areas”

• Law 12.276/10 “Onerous assignment” to Petrobras of certain pre-salt acreage (5 billion-barrels of federal oil reserves for Petrobras stock, increasing government control of Petrobras, which is partially privatized)

• Law 12.304/10 Creates PPSA, a state-owned company to manage government's interests in PSCs and to market government’s production share
Law 12.351/10 (1)

- Creates PSC regime for pre-salt and “strategic areas”
- PSCs may be awarded to Petrobras without bidding
- PSCs may also be awarded by a bidding process to Petrobras and IOCs

- National Energy Policy Council (CNPE), Resolution CNPE n.° 6/2007, Article 3°: new petroleum regulatory framework must honor existing concession agreements as vested rights
Production Sharing Contract

• Host Government Instrument (HGI) for petroleum exploration and development
  – Contracting investor(s) assume all risk of exploration, appraisal, development, and production
  – Subject to a minimum Host-Government (HG) take, “commerciality” allows contracting investor(s) to recoup costs in form of cost petroleum and a contractually established share of profit petroleum, which is ordinarily subject to income tax.
  – HG/NOC takes remaining profit oil
The New Pre-Salt Regime

• The new law offers few details about the fiscal terms, including cost-oil calculations
  – But PPSA is likely to insist on some minimum profit oil share, likely 50% or more
• PSC term is 35 years
• An interest in a PSC may only be assigned with prior consent of MM&E upon advise of ANP and subject to a right of first refusal in favor of other parties
• Petrobras must maintain operatorship and a 30% interest but may assign any interests that it holds in excess of 30%, subject to the above requirements
• PSCs will be governed by Brazilian law but may include arbitration provisions
The New Pre-Salt Regime

Unresolved matters:
- The draft PSC
- Local content
- Bid round procedures
- Revenue sharing among federal, state, and local governments
- Operating Agreement provisions
- Unitization Agreement provisions
CNPE and MM&E will define bid process, oil marketing policy, minimum local content, approve bid terms, and form of PSC

ANP will draft bid terms, conduct bid process, and draft PSC

- Bid terms will define blocks, define key terms, specify local content, specify form of mandatory consortium, set signing bonus, specify bidding qualifications, specify minimum investments, and set bid guarantees
- PSCs will include a royalty to be set by ANP
• MM&E through ANP will contract with IOCs
  – PSCs awarded by bid on HG’s share of profit oil
  – Petrobras to be operator of PSC blocks with 30% minimum interest
  – PPSA will be government representative on PSC operating committee
    • PPSA will appoint chair, half of members of operating committee, and chair will have effective veto power over operating committee decisions
Law 12.351/10 (4)

- Marketing of production will be done by PPSA or Petrobras
- Creates Social Fund for Investment in education, culture, sports, public health, science, technology, and environment
  - Social Fund revenues include part of signing bonus, royalties, crude oil sales revenue, and other revenues.
  - Social Fund resources will be invested in foreign assets
- New policy for small and medium size petroleum companies working onshore is contemplated
PSC JV, Operator, Operating Committee

JV among Petrobras, PPSA, and IOCs:

- Petrobras, as operator, will develop work programs and budgets
- Operating Committee (OC) will approve work program and budgets
- 1/2 of OC, including chairman, will be chosen by PPSA, who bears no risk of exploration, development, or production
- Other JV participants, including Petrobras, nominate the other 1/2.
Brazil PSC Operating Committee

Law 12.351/10 (a few of the provisions)

• Defines
  – exploration plan for ANP approval
  – evaluation plan for discovery for ANP approval
  – annual work & production programs for ANP approval
• Approve budgets for exploration, evaluation, development, & production
• Supervise operations & approve accounting for costs
• Define terms of unitization agreement
• Carry out attributions defined in PSC
Brazil PSC

- Gross Production
  - Government Royalty
  - Profit (& Deemed Profit) Petroleum
    - PPSA's Share Profit Petroleum
    - Contractors' Share Profit Petroleum*
  - Contractors' Cost Recovery Petroleum*
  - Contractor's Taxes**
    - Contractor's Profit Net of Gov't Take*

* Includes Petrobras' share—30% minimum
** No Special Participation
Law 12.351

Brazil Presidency

CNPE

MM&E

ANP

PPSA

Petrobras

EPE
CNPE

- Determines rate of bid offerings
- Determines blocks to be awarded directly to Petrobras
- Determines blocks to be offered through bid round
- Determines technical and economic parameters of contracts
- Defines pre-salt and strategic areas
- Determines marketing policy for HG’s petroleum share
- Determines gas commercialization policy for pre-salt area
MM&E

- Plans for effective and efficient use of petroleum
- In consultation with ANP, proposes blocks to offered at PSC bid rounds to CNPE
- Proposes to CNPE certain technical and fiscal terms for PSCs
  - Amount of signature bonus, HG’s minimum profit-oil share, minimum Petrobras participation (not less than 30%), maximum annual cost-oil allocation, minimum local content
- Direct ANP’s conduct of bid rounds
- Approve draft of PSC
ANP

- Promote technical studies to assist MM&E in selecting blocks for PSC bid rounds
- Prepare the contracts and tender protocols, subject to MM&E approval
- Promote bid rounds
- Assure use of “best practices” by the oil industry
- Analyze and approve exploration, appraisal, development, and production plans
- Supervision of activities under a PSC
PPSA

Law 12.304/2010

- PPSA: new sub-salt NOC, wholly government owned
  - Represents interest of HG in management of PSCs
  - Appoints half the members and chairman or Operating Committee (presumably giving it effective veto power)

- Establishes marketing strategy for HG share of profit oil
  - Money goes to Social Fund for anti-poverty, educational, cultural, scientific, environmental projects and programs
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The New Pre-Salt Regime

• Pre-salt is subject to mandatory unitization under the supervision of ANP
  – Expect ANP to play active role in negotiating unitization agreements
• If parties cannot reach agreement within time frame set by ANP, then ANP may then decree unitization based upon a technical opinion
• Two things are different from prior law:
  1. PPSA, not ANP, will represent the interests of open blocks wholly or partially in Pre-Salt area that are to be included in the unitized area
  2. Unitization of open blocks in pre-salt will occur on a PSC basis
• Otherwise, unitization must respect both concession and PSC regimes with local content rules set by ANP
Three new categories of HGIs and one old:

1. Direct transfer (“onerous assignment”) of 5 billion barrels of oil equivalent (mostly from Franco, but including other pre-salt reservoirs under a distinct contractual arrangement

2. Petrobras (and PPSA) may be awarded PSCs without bidding for blocks recommended by National Council for Energy Policy (CNPE) and designated by the President

3. A JV among PPSA and Petrobras and possibly IOCs in bid process, with Petrobras holding a minimum participation of 30% and operatorship

4. [Old] Existing concessions in pre-salt will be honored
Why the concern about Pre-Salt Unitization? (2)

- Potential for large reservoirs
- Potential that reservoirs will overlap multiple blocks from different bid rounds
  - E.g., different local content, different minimum bids and work
- Potential for multiple variations for blocks
  1. Concession areas
     - Some concession areas perhaps subject to special participation
  2. “Onerous Assignment” areas awarded to Petrobras
  3. PSC areas directly awarded to Petrobras
  4. PSC areas awarded in bid rounds to Petrobras
  5. PSC areas awarded to JV parties in bid rounds with Petrobras having 30% interest and operatorship
  6. PSC areas awarded to JV parties in bid rounds with Petrobras having participated in bid round—perhaps taking a larger interest
  7. Potential for areas not yet subject to HGI
Pre-Salt Tupi Area
Law 12.351/2010
PSC Contract Variables

PSCs between MM&E &
without participating in Bid Rounds

Petrobras

with participating in Bid Rounds

Petrobras only

IOCs including Petrobras

PPSA: half + Chair of Operating Committee

Petrobras: “operator”

Courtesy of Marilda Rosado
Petrobras Onerous Assignment
Law 12.276/2010

- Authorizes assignment of 5 billion barrels of pre-salt reserves directly to Petrobras,
  - Part of capitalization effort
  - Greater stock ownership in Brazilian government
- Steps:
  - Government to select areas to be assigned from areas not under concession
  - Petrobras to evaluate areas and internally approve or seek reevaluation and negotiate changes
  - Petrobras and Government to negotiate contract terms
  - Formal assignment
Onerous Assignment Area

Orange: onerous assignment area

Grey: Pre-salt blocks

Yellow: Post-salt discoveries
# Volumes and Values

<table>
<thead>
<tr>
<th>Bloco</th>
<th>Área (km²)</th>
<th>Volume do contrato (MM boe)</th>
<th>Volume 3C (MM boe)</th>
<th>Valor (US$/boe)</th>
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<tbody>
<tr>
<td>Franco</td>
<td>1.255</td>
<td>3.058</td>
<td>6.056</td>
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<td>Entorno de Iara</td>
<td>611</td>
<td>600</td>
<td>1.088</td>
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<td>Florim</td>
<td>292</td>
<td>467</td>
<td>467*</td>
<td>9,01</td>
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<tr>
<td>NE de Tupi</td>
<td>291</td>
<td>428</td>
<td>428*</td>
<td>8,54</td>
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<td>Sul de Guará</td>
<td>144</td>
<td>319</td>
<td>319*</td>
<td>7,94</td>
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<tr>
<td>Sul de Tupi</td>
<td>203</td>
<td>128</td>
<td>128*</td>
<td>7,85</td>
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<tr>
<td>Peroba (bloco contingente)</td>
<td>1.069</td>
<td>-</td>
<td>1.796*</td>
<td>-</td>
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<th>Cessão Onerosa</th>
<th>Área (Km²)</th>
<th>Volume do Contrato (MM boe)</th>
<th>Valor Médio (US$/boe)</th>
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<tr>
<td>Total</td>
<td>3.865</td>
<td>5.000</td>
<td>8,51</td>
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</table>

*Utilizamos valores Pmean para os volumes prospectivos. Para os volumes contingentes, quando o volume incorpora volume 3C, realizada interpolação entre os valores 2C e 3C.

**Total (milhões):**

US$ 42.533 / R$ 74.808
Why the concern about Pre-Salt Unitization? (3)

Law 12.351/10

• Art. 27 of prior hydrocarbon law revoked for “pre-salt”
• Unitization to occur whenever the “reservoir should extend” beyond the block granted or contracted
  – Reservoir “should extend” suggests “probability”
• Concessionaire or PSC Contractor must inform ANP of discovery of overlapping reservoir, triggering necessity to unitize
• Development and production is suspended pending unitization, except as authorized and conditioned by ANP
Why the concern about Pre-Salt Unitization? (4)

Law 12.351/10

• PPSA, with help from ANP (which may contract with Petrobras for evaluations), will celebrate the unitization of production agreement where fields include areas that are not yet subject to a HGI
  – Future holder of HGI to such an area is bound by the terms of the unitization of production agreement
  – HGI for such an does not have to be the same as the HGI for other blocks already subject to a HGI
• Most new areas will most likely be PSCs
Why the concern about Pre-Salt Unitization? (5)

Law 12.351/10

- PPSA voting power on unitization issues
- New law does not mandate that Petrobras be named “unit operator” (Article 35 of Law n.º 12.351/2010), but tension about designation of unit operator is likely if part of unit includes a PSC or Onerous Assignment area
Pre-Salt Unitization Agreement

Law 12.351/10

• ANP regulates procedures and guidelines to prepare “unitization of production agreement,” which defines
  – Participation of each party in unitized field
  – Development plan for unitization area
  – Conflict resolution
  – Appoint respective field operator
• ANP sets deadline for parties to celebrate unitization of production agreement
  – ANP to monitor unitization negotiation
Pre-Salt Unitization Agreement

Law 12.351/10

- ANP must approve unitization of production agreement
  - ANP has 60 days to approve
  - If parties do not meet deadline, then ANP will determine unitization based on a technical opinion
  - To be done in 120 days

- PSC shall be terminated due to refusal to sign the production unitization agreement, following ANP’s decision
  - Question: If one JV party to a PSC refuses to sign, will whole PSC terminate, or will PSC survive with remaining parties assuming the rights of the non-signing party?
Brazil Law 12.351/2010
Unitization Provisions

• Art. 33. The unitization of production activities of oil, natural gas and other hydrocarbons shall be set up whenever the field should extend beyond the block granted or contracted under the production sharing model.
Brazil Law 12.351/2010
Unitization Provisions

• 10

• § 1 The concessionaire or contractor under the production sharing model shall inform the ANP that the field shall be subject to an unitization of production agreement.

• § 2 The ANP shall set forth the deadline for the parties to celebrate the unitization of production agreement, in observance of the guidelines issued by the CNPE.
Brazil Law 12.351/2010
Unitization Provisions

• Art. 34. The ANP shall regulate the procedures and guidelines used to prepare the unitization of production agreement, which shall define:
  – I – the participation of each of the parties in the unitized field, as well as the hypotheses and criteria for its revision;
  – II – the development plan pertaining to the area subject to unitization of production; and

• The ANP shall follow up the negotiation between the interested parties regarding the provisions of the unitization of production agreement
Brazil Law 12.351/2010
Unitization Provisions

• Art. 35. The unitization of production agreement shall appoint the respective field operator.
• Art. 36. The Federal Government, represented by the public company referred to in § 1 of art. 8, and based on surveys carried out by the ANP, shall celebrate an unitization of production agreement with the parties in cases where fields belonging to the pre-salt area and other strategic areas should extend beyond areas not being shared or assigned. The future concessionaire or contractor under the production sharing model shall be obliged by the terms and provisions of such unitization of production agreement.
Brazil Law 12.351/2010
Unitization Provisions

• § 1 The ANP shall provide the public company referred to in § 1 of art. 8 with all information required to celebrate the unitization of production agreement.

• § 2 The exploration and production model to be adopted in the areas dealt with in the head is independent of the model being used in adjoining areas.
Brazil Law 12.351/2010
Unitization Provisions

• Art. 37. The Federal Government, represented by the ANP, shall celebrate an unitization of production agreement with the interested parties after the respective evaluations of fields not located within the pre-salt areas or other strategic areas and extending beyond non-assigned areas. The future concessionaire shall be obliged by the terms and conditions of such agreement.
Brazil Law 12.351/2010
Unitization Provisions

• Art. 38. The ANP may enter into contract directly with Petrobras in order to carry out the field evaluation activities provided in arts. 36 and 37.
• Art. 39. The unitization of production agreements shall be submitted to previous approval by the ANP.
• The ANP must issue an opinion within 60 (sixty) days from the receipt of such proposal.
Brazil Law 12.351/2010
Unitization Provisions

• Art. 40. Once the term set forth in § 2 of art. 33 will have elapsed, and no agreement is reached between the parties, the ANP shall determine, in up to 120 (one hundred and twenty) days, and based on a technical opinion, the form by which rights and obligations over the field shall be appropriated and shall notify the parties to sign the respective unitization of production agreement.
Pre-Salt Unitization
Summary of Key Matters

• PPSA will represent HG if reservoir is located within pre-salt and strategic area and extending to areas not yet granted (art. 36)
• ANP will represent HG if reservoir is located outside of pre-salt and strategic area extending to areas not yet granted (art. 37)
• ANP will determine time limit for parties to reach a production unitization agreement (art. 33, § 2)
• Agreement must be submitted to ANP for approval (art. 39)
• ANP will arbitrate any failure to agree (art. 40)
• Contract rights will terminate if party declines to sign unit plan after ANP decision
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Spindletop
SPINDLETOP GUSHER NEAR BEAUMONT, TEXAS IN 1901.

The well flowed between 75,000 and 100,000 barrels of oil per day for about one week before it was brought under control.
Why the concern about unitization?

• Prevent Waste
  – Surface, economic & underground waste
  – Historically, to counter the problems associated with the Rule of Capture

• Protect correlative rights
Unitization (& Pooling)

• Voluntary
• Compulsory
• Quasi-Compulsory
Unitization in International Practice

• Need:
  – Oil and gas reservoirs do not respect “block boundaries”!
  – Likelihood of overlap is inversely proportional to block sizes

• Objective:
  – Prevent surface, underground, and economic waste
  – Protect correlative rights

• What is unitization:
  – Voluntary or coerced agreement among IOCs holding HGIs in geographically divided blocks to develop a common hydrocarbon reservoir jointly

• Cross-Border:
  – Treaty/agreement among HGs having geographically divided interests in a common reservoir (with unit agreement among affected IOCs)

• Joint Development Zones:
  – Treaty/agreement among HGs having geographically divided interests in a common reservoir (with unit agreement among affected IOCs) where international boundaries are disputed
UNITIZATION OBJECTIVE (details)

Optimize Reservoir Development:
• Rationalize Expenditures
  • Minimize CAPEX and OPEX
  • Avoid duplication
• Increase recovery by delaying abandonment
  • Prevent Waste (economic, underground, surface, & environmental) by assuring efficient, orderly, and environmentally responsible development and by facilitating joint operations to maximize efficient hydrocarbon recovery
  • Protect Correlative Rights: fairly allocate production and costs among working interests
  • Modify Rule of Capture (if recognized at all)
• Avoid disputes
  • Provide means of resolving any disputes that may arise
HG’s Interest in Unitization (1)

• Conservation, orderly development, maximum production, & assurance of proper abandonment
  – If HGI is royalty/tax,
  – if all blocks provide for same HG take, and
  – if there is no transboundary issue,
then HG will care little about how IOCs allocate production
or about development expenditures so long as hydrocarbon
recovery is optimized
  – Failing any of these three “ifs,” HG will care
  – **Brazilian Government (ANP & PPSA) will care!**
HG’s Interest in Unitization (2)

- IOCs are commonly authorized and encouraged to unitize, subject to HG approval
- HG retains right to approve unit development plan
- HG retains right to approve unitization agreement
- HG may specify a minimum interest for Unit Operator
- HG may pressure “strategic” bargainers to come to terms
- HG may order “compulsory unitization”
  - Some HGs may rely on independent experts
Unitization Policy

• Nearly all HG have a unitization “trigger”
  – Geology indicating a common reservoir (e.g., Brazil)
  – Some countries also have an “economic” trigger, focusing on economic waste (perhaps Brazil if “reservoir” (“campos”) could mean unitizing multiple reservoirs to save money

• Some countries (including Brazil), require Operator to notify HG of existence of a common reservoir

• Most countries (including Brazil) mandate unitization of common reservoirs

• Some countries give discovering parties a preferential right to expand the contract area into an “open” block to cover the unitized area (not Brazil)
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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>Not directly mentioned in law</td>
<td>The regulatory authority determines if there is a case. Depending on the mining contract, requirements on information to be provided by the contractors on reservoirs straddling permits differ.</td>
<td>There are no specific cases today.</td>
<td>The regulatory authority holds the prerogative to impose development conditions.</td>
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<tr>
<td>Brunei</td>
<td>yes</td>
<td>Prime Minister</td>
<td>Depends from the instructions of the PM</td>
<td>The Prime Minister has the liberty to decide</td>
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<tr>
<td>Cameroun</td>
<td>yes</td>
<td>Title holders</td>
<td>Minister of Hydrocarbons can refuse development.</td>
<td>No mention in the law</td>
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<tr>
<td>Congo</td>
<td>yes</td>
<td>Title holders</td>
<td>Yes. The hydrocarbons Minister can impose if Title holders do not propose.</td>
<td>The Hydrocarbons Minister has the authority to impose the process.</td>
</tr>
<tr>
<td>Netherlands</td>
<td>yes</td>
<td>Title holders</td>
<td>Yes, but the competent Minister can grant an exception.</td>
<td>no</td>
</tr>
<tr>
<td>Nigeria</td>
<td>yes</td>
<td>The Minister of Petroleum</td>
<td>Yes but only for reservoirs straddling two or more mining titles</td>
<td>A guide issued by the regulatory authority exists but is not compulsory</td>
</tr>
<tr>
<td>Norway</td>
<td>yes</td>
<td>Title holders</td>
<td>Yes because the Ministry can intervene if joint agreements take too long to reach.</td>
<td>The Ministry may determine how joint petroleum activities shall be conducted (section 4-7)</td>
</tr>
<tr>
<td>UK</td>
<td>yes</td>
<td>Title holders</td>
<td>Secretary of State has the power to impose, but it is assumed that commercial interests will lead participants to discuss unitization before the Secretary of State needs to intervene</td>
<td>no</td>
</tr>
<tr>
<td>US_GOM</td>
<td>yes</td>
<td>Regional supervisor of the Mineral Mining Service Or A party may file a request</td>
<td>In theory yes. The MMS has not approved a forced unitization in the US for over 30 years.</td>
<td>In practice the regulations are designed and administered to make it almost impossible to accomplish such a goal. This is especially true in the deepwater as the regulations have not evolved to keep pace with technological developments.</td>
</tr>
</tbody>
</table>
Typical Unitization Process

1. Discovery block A
2. Declaration of commerciality
3. Discovery block B
4. Determination of Common Reservoir
5. Pre-unitization Agreement
6. Appraisal/geosciences studies
7. Production period
8. Unitization Agreement
9. Request for re-determination
10. Expert
11. Re-determination
12. Reallocation of costs and hydrocarbons
13. Decommissioning
Pre-Unitization

- **If** initial exploration or development indicates an overlapping reservoir, then a unitization study occurs
  - Actual unitization may be impractical if parties have insufficient information about the reservoir
- **Pre-Unitization Agreement** is really a series of agreements:
  - Confidentiality Agreement
  - Data Exchange Agreement
    - Risk of strategic information sharing & non-sharing
    - Perhaps some obligation to be fully forthcoming (or not)
    - May be some cost-sharing (one block’s information may have been more costly to acquire than other block’s information)
  - Joint Study Agreement (study may contemplate actual joint “operations”, e.g., seismic acquisition or drilling and “contributions” through “support” letters)
  - Pre-Unitization Agreement (basic unitization principles)
Pre-Unitization Operations

• Parties often agree to use “passmark” voting procedure under each existing JOA

• If the “passmark” is met, then Operator under each JOA casts vote in Joint Study Committee meeting
  – Unanimous or “super-majority” vote of JOA operators may be required
  – Operator of block where pre-unitization operation is to take place often serves as Operator for the operation and accounting procedure under that Operator’s JOA may govern
  – Costs of pre-unit operation are allocated among blocks as provided in Pre-Unit Agreement and then further allocated under each applicable JOA
Timing is Everything!

• Generally, the earlier the effort to unitize the easier unitization will be achieved
  – The more information that is obtained about a reservoir, the more difficult it may be for the parties to agree on the production allocations
• This may seem counterintuitive
  – Transparency and full information does not mean consistency of information
  – Differing levels of sunk investments in each block
  – Psychological barriers
• Norm is protracted & complex cost & production allocation negotiations
Unit Agreement & Unit Development Plan Team

- Unit Agreement: technical, operational, economic, and legal document
- Negotiating team assisted by geophysicists, geologists, petroleum engineers, economists, accountants, and lawyers
- Due to multiple IOCs in each block, several levels of negotiation may be needed
  - Negotiations within each block may be the most contentious
  - Negotiations become more complex if reservoir crosses an international boundary or crosses more than 2 blocks
- But parties have incentive to agree
  - HG will not likely allow “development” without unitization
  - If negotiations break down, HG may mandate compulsory unitization on terms that no parties like
Unit Agreement Philosophy

- Unit Agreement allows parties, holding interests in different blocks, to act jointly as if there is only a single block for purposes of unit operations
- Unit Agreement is a contract, not cross-transfer of title
- Unit Operator will maintain “unit equipment” and “unit account”
- Related contracts should conform to Unit Agreement and Plan as necessary
  - HGI(s) might be modified with HG approval
    - E.g., HG may allow unit production to extend term of one (some) HGI(s) so that all HGI(s) will terminate simultaneously
  - JOA, Farmout Agreements, Production Sales Contracts may need modification
Scope of Unit Agreement (1)

- Unit Operations and Non-Unit Operations:
  - Non-unit operations are operations not directed to Unit Interval (i.e., the unitized reservoir)
  - But both “Unit Operations” & “Non-Unit Operations” (defined terms) may be conducted within Unit Area
Scope of Unit Agreement (2)

Unit Agreement implements & governs unit plan of development

Defines:
- “Unit Area” geographically
- “Unitized Interval” geologically
- “Unitized Substances” (including injected substances) consistent with HGI and law
  - Possibly, only oil (or only gas) may exist in all blocks, so only one substance is unitized
  - Where both oil and gas are unitized, production allocations may be differ because one block might have more oil and another more gas
  - In a gas-drive reservoir, gas production may be limited to conserve reservoir energy
- Above is usually done in attached exhibits
- Unit Agreement addresses possible changes in area, interval, and substances
Scope of Unit Agreement (3)

• Unit Agreement is limited to “unit area” and “unit interval”
• Thus, JOAs continue to operate too
  – JOAs still govern all matters not related to “unit area” and “unit interval”
  – But non-unit operations within “unit area” are typically subordinate to unit operations
Contents of Unit Agreement

- Designate Unit Operator (possible contract teams or even create a separate operator entity) and rights, duties & powers
- Unit operating committee and rights, duties & powers
- Development, Operation, & Abandonment of Unit Interval
- “Passmark” Voting Process for work programs and AFEs (later slide)
- Production & Cost Allocations (later slides)
- Financing of Costs (including “Carried” Parties)
- Unit assumes relevant existing data, facilities, and related costs
- Commencement and duration
- Address possible expansion/reduction of Unit Area/Unit Interval
- Representations
- Warranties
- Default
- “Sole-risk” (exclusive) Operations
- Non-unit Operations
- Transfers & Withdrawals
- Preserve JOAs to extent possible
- Extend HGIIs for duration of unit operations
Critical Unitization Matters

- Define unit area geographically
- Define unit interval geologically
- Address possible unit expansion
- Determine unit participating interest
- Address non-unit & sole-risk operations
- Designate unit operator
- Unit Governance, including “passmark” vote
- Redetermination of unit participating interests
Unit Operator

• Can be contentious
• Often, party with largest interest
• But perhaps most technically experienced party in area
• Perhaps party with best HG relations
• Brazil: Unit Operator does not have to be Petrobras—even though Petrobras has to be PSC Operator, but Petrobras will likely often be the unit operator
Unitization “Passmark” Vote

• Holders of large interests do not want their development plans fettered by holders of small interests
• Holders of small interests do not want to be forced to participate in operations that are not a high priority
• Thus, passmark vote is a contentious negotiating issue
  – Except for a very small proportionate interest in a unit by a block, passmark may require at least one interest holder in each block to favor a proposal
  – Passmark will likely require a “super-majority of interest” holders—perhaps unanimous, with disputes referred to expert
  – Doing nothing is not a likely option because IOCs are obliged to develop under HGI
• NOTE:
  • Passmark voting power will often be based upon allocation of interests in the unit
  • Thus, passmark voting power will change if unit interest allocations are re-determined
Production & Cost Allocations

• A key but contentious issue:
  – It is economically difficult
  – It is psychologically difficult

• Usually allocated among “Blocks”
  – Initial allocation is usually subject to a re-determination because initial technical data is thin—contentious!
  – Block allocations are further divided into Unit Participation Interests by referencing each party’s JOA participating interest in each block—simple!
Goal and Result

• Goal: Each Block’s (and Party’s) share of unit production should be proportional to the value of that Block’s (and Party’s) contribution to the unit
  – Cannot be perfectly achieved, but all should gain from a greater ultimate recovery

• Result: Each Party’s Unit Participation Interest determines that Party’s:
  – Share of unit development costs (less any credits for pre-unit expenses)
    • A Party does not wish to pay more than its fair share of expenses
  – Share of production
    • A Party wants a fair share or more of any resulting production
  – Voting power
Why allocations are difficult:

- Reservoirs are generally not homogeneous
- Parties are not homogenous
- HGIs for the various Blocks may not be identical
Why allocations are difficult (cont):

- Generally, reservoirs are heterogeneous, not homogeneous:
  - Variable porosity
  - Variable permeability
  - Variable thickness of the reservoir
  - Complex reservoir geology and variations in reservoir rock
  - Some areas within the unit have more recoverable hydrocarbons
  - Some areas within the unit may have a greater proportion of gas
  - Some areas within the unit may have more favorable structure
  - Some areas within the unit area may produce longer than others
  - Some areas within the unit may yield a more efficient recovery (lower cost or more efficient use of reservoir energy)
  - Reservoir energy may be concentrated in less than all Blocks (thus, recoveries may vary across the Blocks)
  - Possible multiple independent (or dependent) reservoirs (lenses)
  - Variations in hydrocarbon fluid properties across the reservoir
  - Reservoir may be predominantly located in one Block
Why allocations are difficult (cont):

- Parties are not homogenous
  - IOCs in one block may be more heavily invested in reservoir development and have already produced substantial hydrocarbons
  - IOCs in one Block may have more reservoir knowledge
  - IOCs within each Block likely have varying % shares within the Block
  - IOCs may disagree about whether use of particular existing facilities
    - contribute any value to unit,
    - some facilities might also be used for non-unit operations
    - some facilities may be unnecessary to unit operations
  - Various tie-in issues respecting existing facilities
  - IOCs may not agree on MER for unit
  - Due to reservoir, contract, or other variations, incurred or anticipated development costs may vary from Block to Block
  - Some IOCs may have history of tense relations with HG or with each other
  - Some IOCs may have “bigger fish to fry”
Why allocations are difficult (cont):

• HGIs for the various Blocks may not be identical
  – Durations and termination dates may vary
  – Minimum-work obligations may differ and be uncompleted in one or more blocks
  – Time periods for work phases may vary
  – Contract conditions and covenants may vary
  – Unitization provisions in HGI may vary
  – Fiscal terms (HG take) may vary (which may make HG keenly interested in allocations)
    • E.g., bidding may have been on fiscal terms
  – Two or more fiscal systems apply within area to be unitized (e.g., Brazil Pre-Salt)
The Parties must consider:

- Credits or Contributions for work already done within each Block—cash or in-kind balancing
- Handling of any remaining exploration, appraisal, or other minimum work commitments, and whether the costs are to be allocated to the unit—any remaining minimum work may be left to a block-basis
- Allocation of costs for work that benefits both unit and non-unit areas and intervals
- Allocation of production
- Redetermination process and conditions
- Possible tax consequences of particular allocations
Consider:
Consider Prior Slide in Possible Brazil Context

- Assume Block A is Petrobras (onerous assignment block)
- Assume Block B is Concession held by IOCs—X (50% & operator), Y (40%), & Z (10%)
- Assume Block C is PSC held by Petrobras and IOCs—Petrobras (30%), V (50%), W (10%) & X (10%)
Redeterminations (1)

• Predicting reservoir behavior and properties in advance of development is difficult
  – Thus, Parties may more easily agree on a preliminary allocation if allocation is revisited when more information is available
  – However, the possibility of a redetermination adds uncertainty
Redeterminations (2)

As more information is gained over time, Parties may wish to make one or more redeterminations of Unit Participation Interests as development progresses:

- A mandatory first redetermination may occur at the time of first unit production or at some other pre-determined time thereafter.
- Subsequent redeterminations may occur on a fixed schedule or only at the request and vote of some super majority (e.g., all participants in at least one block).
UA Redetermination Process

- Often very detailed, but may be only “guidelines”
- Typical Features:
  - Data “cut-off” time
  - Redetermination Committee:
    - Unit Operating Committee or separate Redetermination Committee, comprised of representatives of Parties, directs redetermination work
    - Usually chaired by Unit Operator
    - Subcommittees may study and analyze data: reservoir engineering, geology, geophysics, petrophysics, etc.
  - Timetables: Preliminary decisions made on timetable with opportunity for opponents to revisit prior to final redetermination
  - Dispute resolution: e.g., expert referral for mediation for resolution of technical disputes
  - Final decision process with dispute resolution process (e.g., expert determination)
Prospective or Retroactive?

• If prospective only, then the redetermination will have no effect on the past allocations of costs and production
Prospective or Retroactive?

• Most redeterminations are retroactive or partially retroactive
  – One or more blocks receives a lower retroactive unit participation share partially offset by a retroactive credit for excessive costs previously paid
  – One or more blocks receive a larger retroactive unit participation share partially offset by a proportionately retroactive assessment of a larger share of costs
    • Parties paying a larger share will be especially happy if the unit operations are likely to be highly profitable, but will be unhappy if development is disappointing
    • But “diabolical” redetermination efforts are possible
  – Refund and balancing details are important—often done “in kind” but may be done in cash
Redetermination Factors

- Really the same as for initial allocations, but most important factors are:
  - Porosity variables
  - Permeability variables
  - Hydrocarbons initially in place for each block
  - Initial recoverable reserves in each block
  - Economically recoverable reserves in each block
  - Structure variables
  - Thickness of Pay or Reservoir variables
  - Reservoir Energy vis-à-vis block location
  - Gas v. oil volumes in each block and likelihood of gas production
Practical Effect of Redeterminations

• Redeterminations are difficult to negotiate
  – Economically difficult
  – Psychologically difficult
  – Although “technical,” the interpretation of the data is not an exact science

• Although more information should lead to a more equitable redetermination, the complexity of the data, the diversity of interpretation of the data, and strategic bargaining spurs heated arguments—often leading to dispute resolution

• In the end, redeterminations are costly in time, money, and relationships

• Hence, the fewer the redeterminations, the better!
Difficult Redetermination Variations

1. Reservoir overlaps into area not yet subject to a HGI
2. A second reservoir internal to one Block has been discovered by the IOCs for that Block that largely within unit area but below the Unit Interval
3. A second reservoir, thought to be internal to one block, turns out to be in communication with the Unit Interval