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# Masterclass: Reserves Booking under PRMS

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# Warning!



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- This presentation has Reserves content
  - Reserves discussions are known to cause drowsiness, restlessness and in extreme cases feelings of nausea. In the event of any of these, alcohol is strongly recommended
  - Nevertheless, reserves assessment should not be undertaken while under the influence of alcohol, drugs or by anyone without an appropriate degree and at least 10 years of practical experience in petroleum engineering or petroleum production geology
  - Failure to comply may result in severe damage to share price

John Boardman, RISC Founder, April 2007

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# What are reserves and why are they important?

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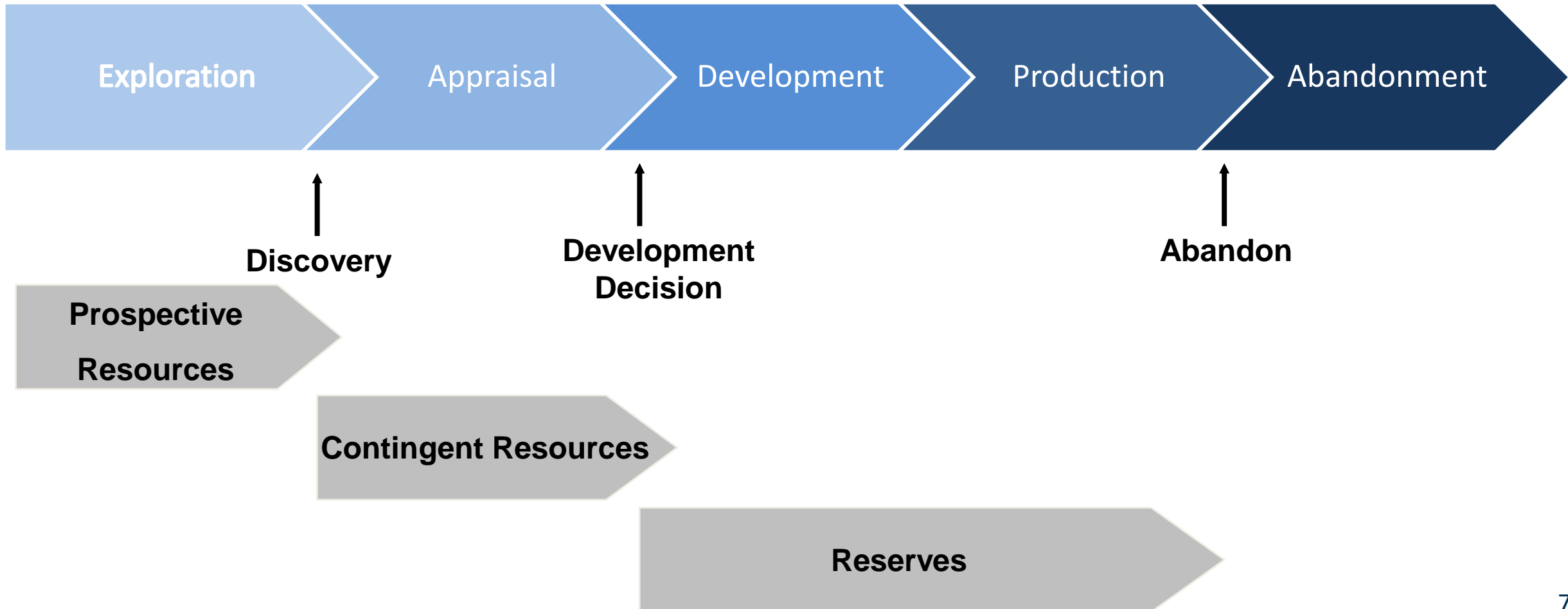
- What are Reserves?
  - A company's share of remaining commercially recoverable oil and gas to be produced and sold
  - Reserves are the main Upstream asset of an E&P company
  - They contribute to a field's value, the company's value and therefore share price
- Reserves have many purposes:
  - Corporate reporting
  - Asset valuation for acquisitions and divestments
  - Investment decisions for financing
  - Government planning

- International – PRMS\* (Petroleum Resource Management System)
- USA – SEC (Securities and Exchange Commission)
- Canada – COGE (Canadian Oil and Gas Evaluation)
- Other countries – eg Russian, Chinese standards
- UNFC (United Nations Framework Classification for Resources)
  
- The PRMS was adapted for CO<sub>2</sub> storage as the SRMS (CO<sub>2</sub> Storage Resources Management System) and the classifications changed to include “Capacity”, which is equivalent to reserves

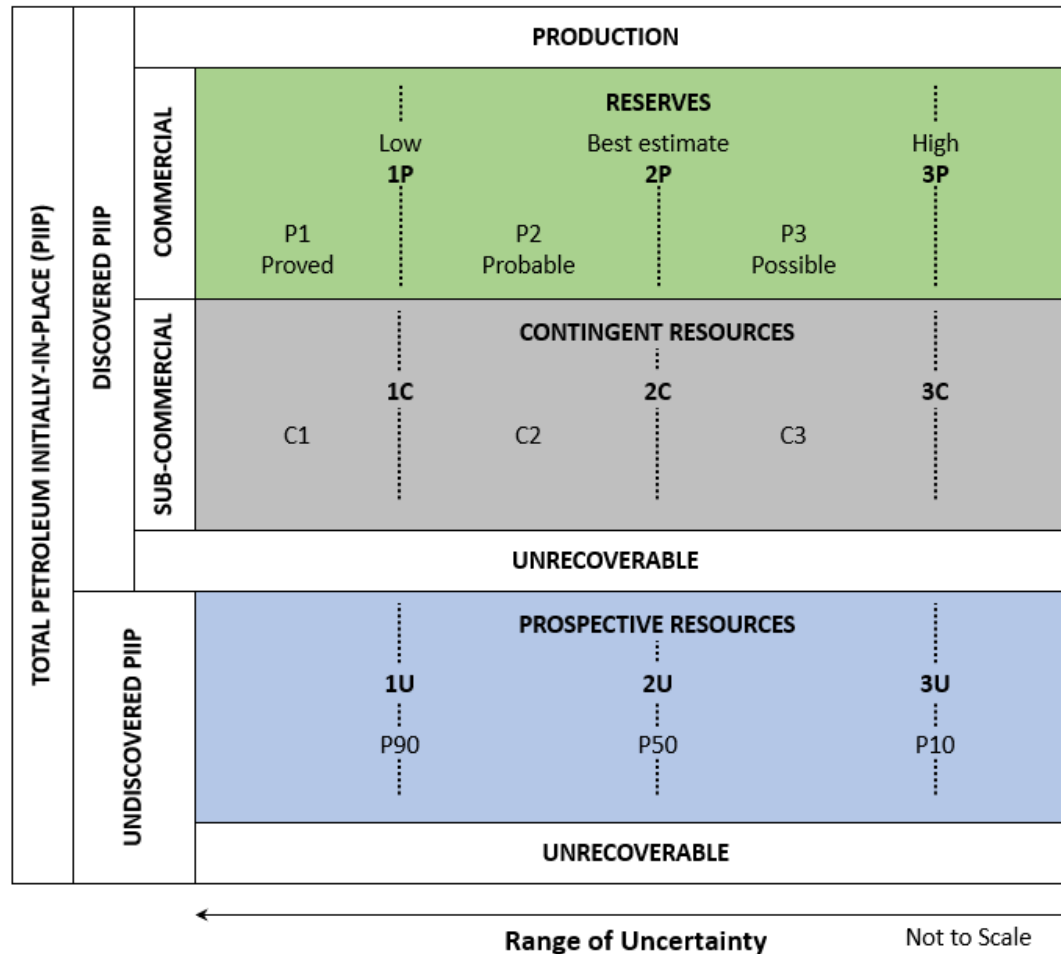
\*The PRMS is available at <https://www.spe.org/en/industry/reserves/>

- Petroleum Resources Management System (PRMS)
  - A classification system for oil and gas reserves
  - Co-sponsored by several industry bodies: SPE, WPC, AAPG, SPEE, SEG, SPWLA and EAGE
  - Uncertainty in recovery of the defined project is evaluated separately from commercialisation risks
  - Based on net sales quantities: accounts for ownership/entitlement

- The PRMS reserves classification depends on maturity and is “project-based”



# PRMS Resource Classification Framework



Increasing Chance of Commerciality

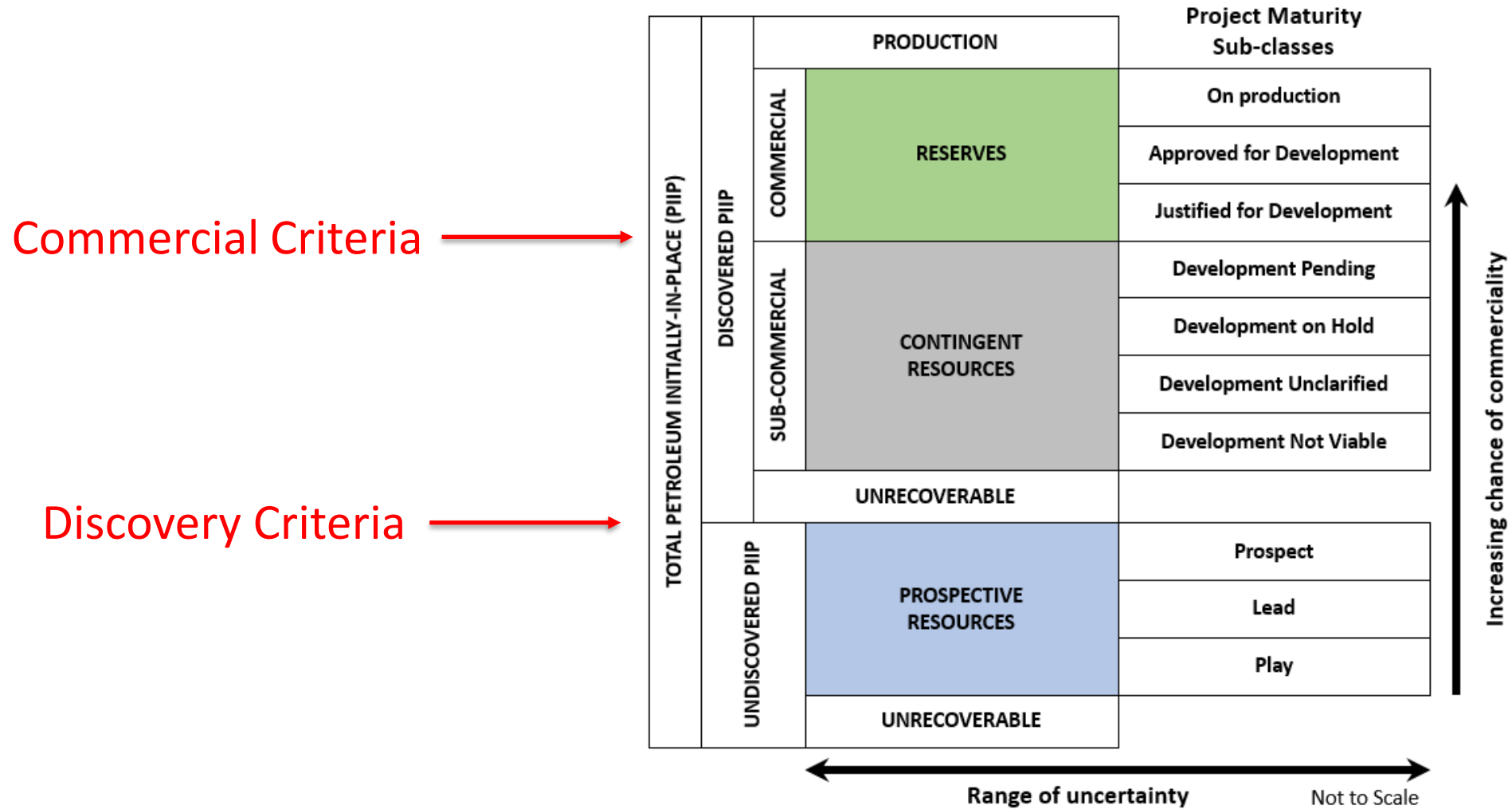
Classify by  
Chance of  
Commerciality of  
project

Categorise based on uncertainty of sales quantities



- Uncertainty will exist in all resources estimates
  - It cannot be avoided. However, it can be managed if it is recognised and understood
  
- Reserves: 1P, 2P, 3P
  - Proved, Proved plus Probable, and Proved plus Probable plus Possible
  
- Uncertainty relates to probability
  - 1P/Low: 90% probability (P90) that the quantities recovered will exceed this
  - 2P/Best: 50% probability (P50) that the quantities recovered will exceed this
  - 3P/High: 10% probability (P10) that the quantities recovered will exceed this
  
- Contingent Resources: 1C, 2C, 3C; Prospective Resources: 1U, 2U, 3U

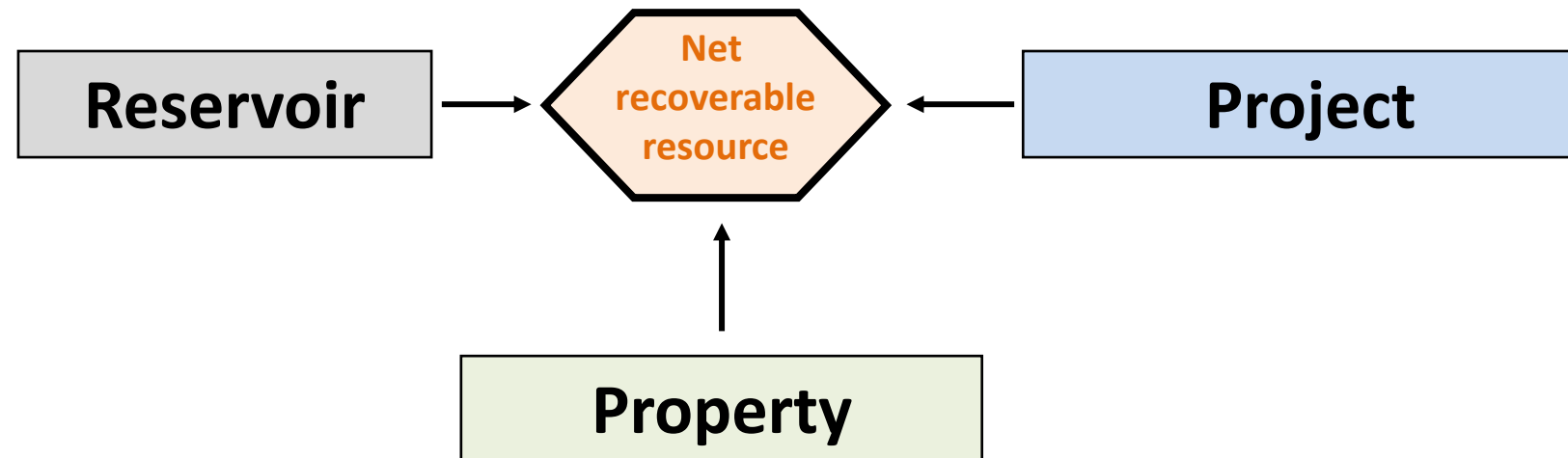
# PRMS Sub-Classes, based on project maturity



- Discovery
  - A well is needed to make a discovery!
  - Established through testing or sampling, the existence of a significant quantity of potentially recoverable hydrocarbons
  - Where there are no samples, logging and a suitable producing analogue can be used

- Commerciality requires evidence of:
  - A technically mature Field Development Plan
  - Finance in place, or expected
  - Intent to initiate development within a reasonable time frame
  - Meeting economic criteria
  - A reasonable expectation of a market for sales products and acceptable treatment/disposal for other product streams (eg water, CO<sub>2</sub>)
  - Production and transportation facilities will be available
  - Evidence that all internal/external approvals will be forthcoming
  
- Positive project economics are only one part of Commerciality
  - A project can be economically attractive but not commercial

- Key elements of the PRMS:
  - Reservoir
  - Property
  - Project



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## Turkey Finds Enormous Gas Field In The Black Sea — But Tricky Process Ahead

Ariel Cohen Contributor

*I cover energy, security, Europe, Russia/Eurasia & the Middle East*

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Sep 18, 2020, 08:52am EDT

In late August, Turkey's president Recep Tayyip Erdogan announced that the Turkish Petroleum Corporation (TPAO)'s FATIH drilling ship discovered a 320 billion cubic meters (bcm) i.e. 11 trillion cubic feet (tcf) of natural gas **reserves** in the Black Sea, within the western part of Turkey's Exclusive Economic Zone (EEZ). The reserve — identified to be within the Tuna-1 exploration zone — was discovered some 4,525 meters below the sea bottom, at near 2 km depth. News of the discovery has been welcomed in Turkey as a game-changer with regards to the country's expensive natural gas import bill.

While certainly a promising development for Turkey's energy security, important unknowns remain surrounding the economic viability of Tuna-1 (aka 'Sakarya'). According to investment banks, the main issue is the economic extractable reserve value of the well and whether this value would justify costly deep-water upstreaming operations.

## What are PROSPECTIVE RESOURCES ?

- They are a company's idea of where they should explore for hydrocarbons
  - Categorised as: 1U, 2U, 3U. Also as Low, Best Estimate and High
  
- A successful exploration well will confirm the presence of oil or gas
  - Volumes become Contingent Resources and possibly Reserves in future
  
- BUT there is a risk there may not be a discovery at all
  - Prospects each have a Chance of Success. A geologist might say this is 10% or 60%
  
- A Chance of Development is also applied

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## What are CONTINGENT RESOURCES ?

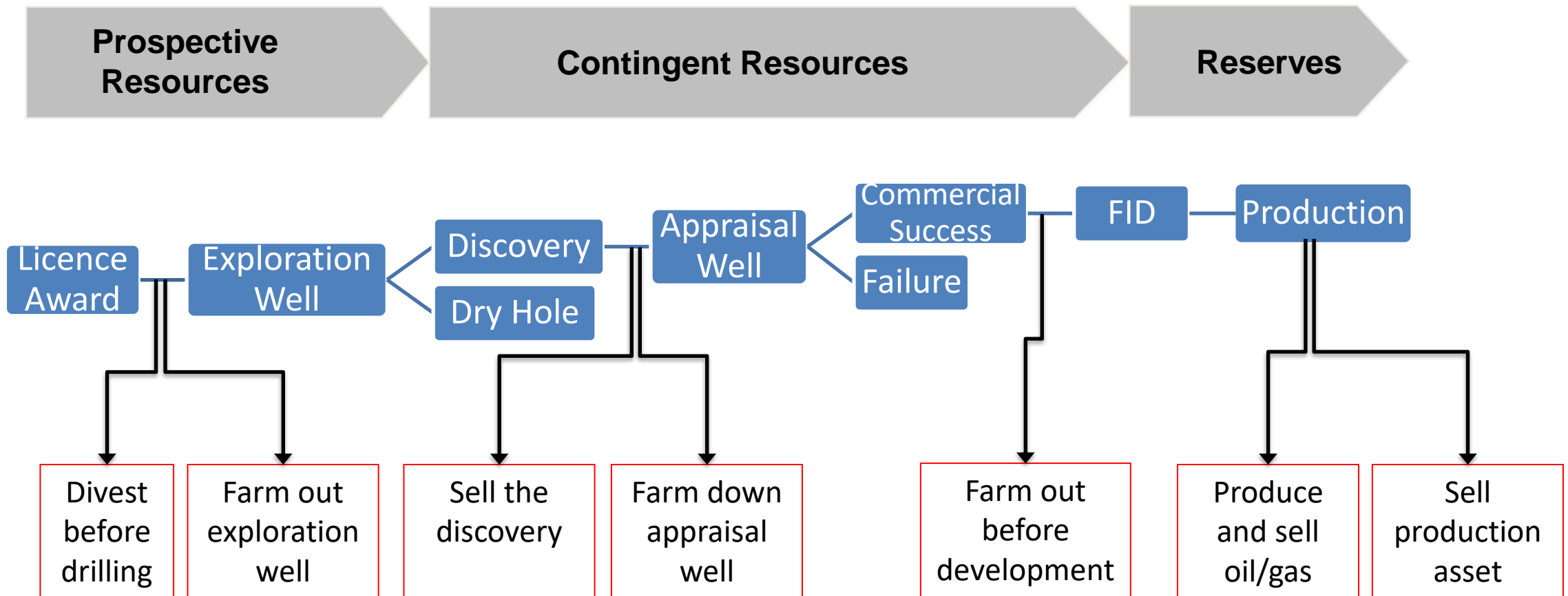
- A discovery with a development project not yet Commercial, due to one or more contingencies
  - Eg a gas field without a market for gas; or a field with high CAPEX making development uneconomic
  - Categorized as: 1C, 2C, 3C
- These can progress to become reserves in future, once they pass the Commerciality criteria
- The Chance of Development applies to these projects



- What are RESERVES?
- Volumes to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions
- Reserves must further satisfy four criteria: discovered, recoverable, commercial, and remaining based on the project
- The uncertainty range in Reserves estimates: 1P, 2P, 3P categories

- The PRMS does not indicate the content of a report. Each jurisdiction will have separate disclosure requirements
  
- Reserves experts write reports for many reasons, including:
  - Stock exchange requirements (LSE, AIM, SEC, TSX, ASX, OSE, SGX, etc...)
    - Annual reserves and resource reports
    - Competent Person's Report for take-overs, defence work, etc.
    - others
  - For financiers (banks and other lenders)
    - e.g. Reserves Based Lending
  - For investors/buyers of upstream assets

# Reserves and resources have value at each stage





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