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Economic and Social Commission for Western Asia (ESCWA)



Geological CO₂ Storage Potential in the ESCWA Region

What will make it happen?

Steve Cawley, Project and Resource Manager,
Carbon Solutions, BP Alternative Energy

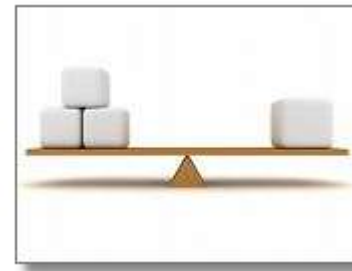
Framing the CCS Opportunity...



CCS
needs...

Capacity and Integrity

- Infrastructure
- Geology



Technology

- Proven at scale
- Driving down costs



..... a
Commercial
Framework

Policy and Regulation

- Investor confidence
- Revenue stream



Regional & National Carbon policy: the early building blocks are there



CDMMaps



- The UN FCCC Clean Development Mechanism is a *beginning*.
- CoP 16 2010 accepted CCS in the CDM
 - Decision 10/CMP.7 adopted Durban 2011

And there is already CCS activity in the region



Kuwait:
Investigating pilot project. Workshop with KPC, OPEC & IEA in 2012

Bahrain:
CO₂ Capture on existing GPIC plant used for Urea and Methanol production. CDM eligible

Qatar:
Qatar Petm and the Sci & Tech Park/Imperial College/Shell R&D collaboration focussed on improved reservoir simulation

Saudi Arabia:
Saudi Aramco Uthmaniya gas plant CO₂-EOR test project to begin injection operations in 2014

Abu Dhabi:

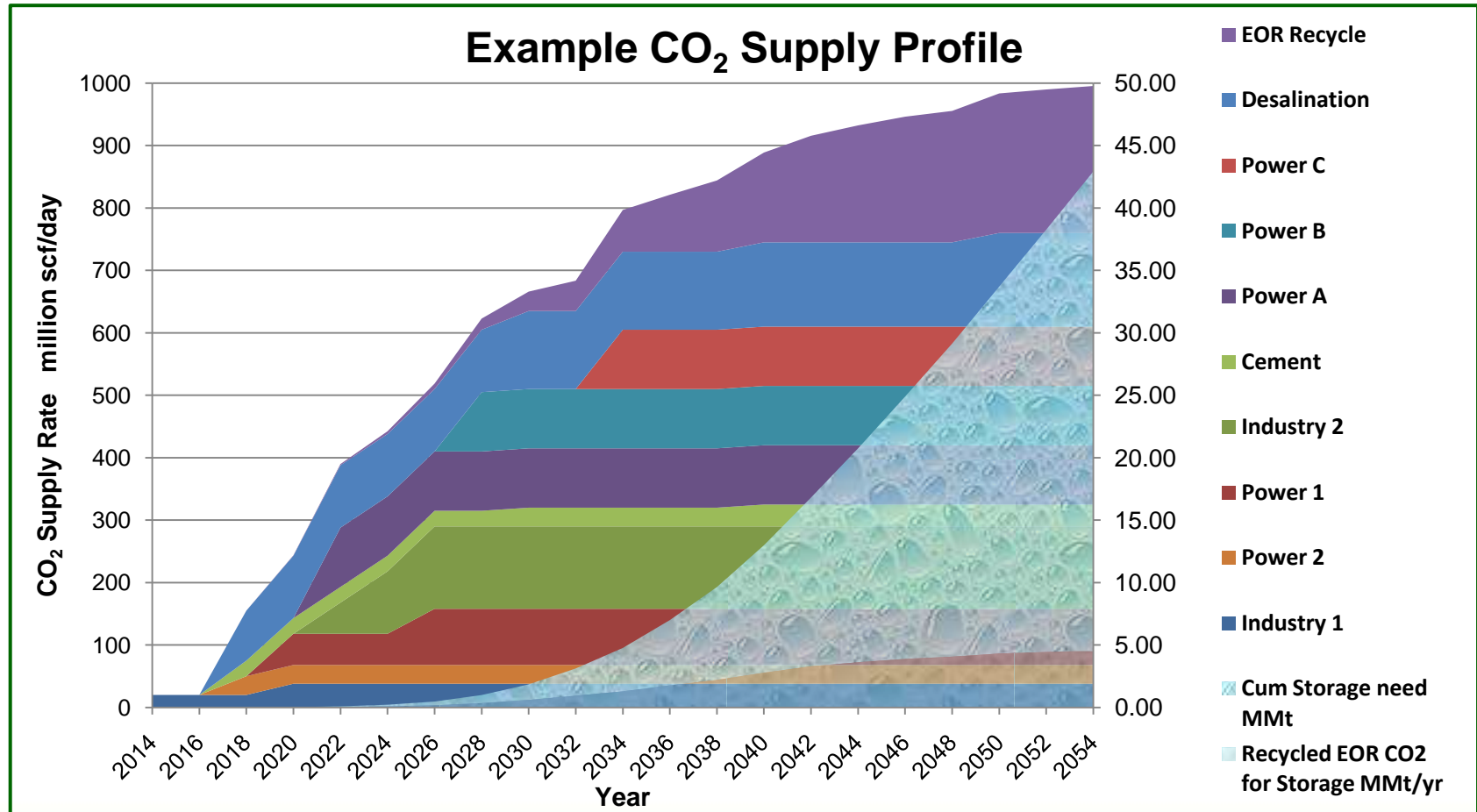
- ADNOC & Masdar working with ESI, TAPCO and EMAL to conduct FEED on CO₂-EOR projects for 2016-18 start-up
- Rumaitha 2009-11 pilot CO₂ injection project

Sources: GCCSI; IHS Energy Ltd (Refineries emitting >1MMtCO₂/yr)

So, what might the CCS opportunity in a typical country with a growth agenda in this region, look like?



Balancing CO₂ Supply & EOR portfolios ... with *Long Term* need for Storage



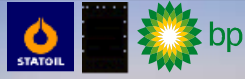
Our experience at In Salah has helped us learn at first hand about building a CCS Project from Design to Operate, with Monitoring built-in from Day 1



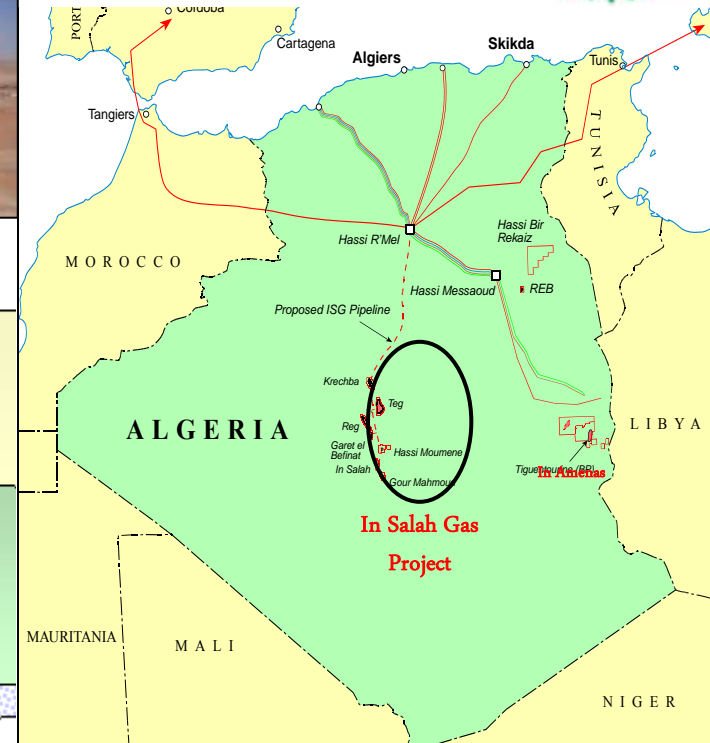
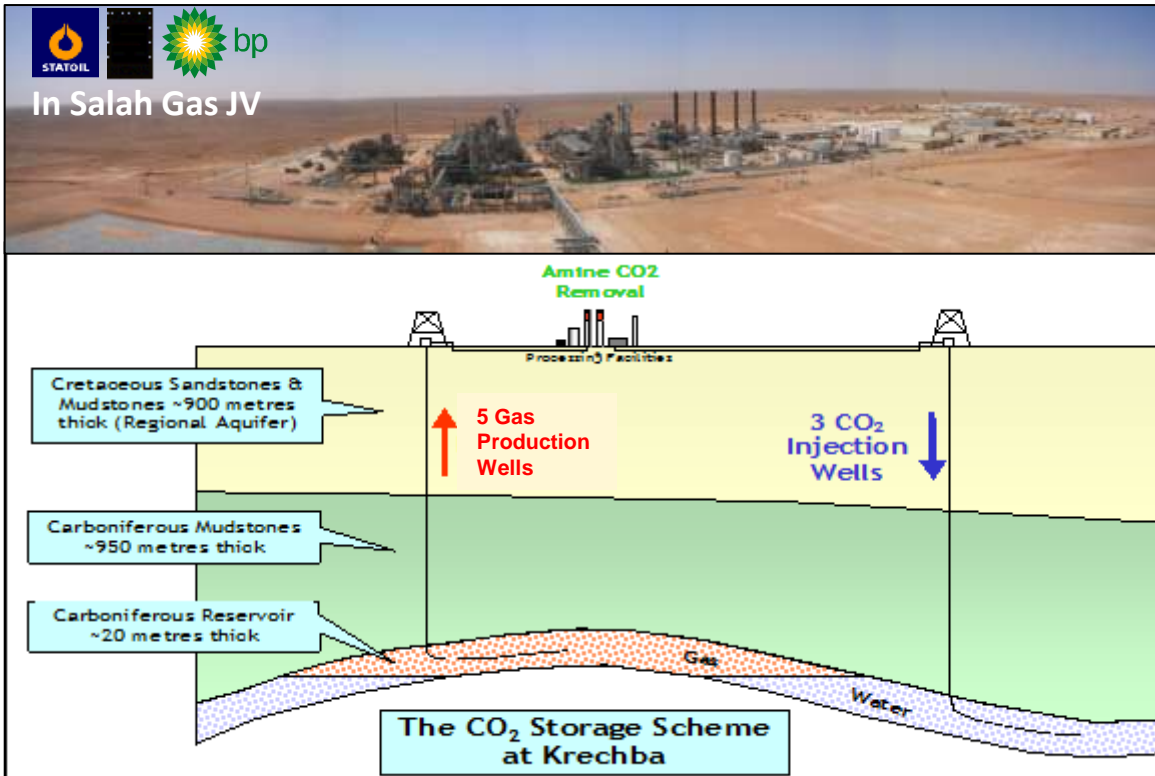
CCS today in Algeria.
What could tomorrow look like in your world?

The In Salah CO2 Injection Project – key facts

bp



In Salah Gas JV



- Industrial Scale Demonstration of CO₂ Geological Storage (Amine Capture)
- Deep Saline Storage Formation at ~2Km; Offset & downdip from Krechba Field GWC
- Storage started August 2004 via 3 Injectors; ended June 2011
- 3.7 MMtCO₂ Stored to date; NO PRESSURE SUPPORT TO PRODUCTION (not EHR)
- No CCS Policy or Regulation ; No commercial benefit to In Salah Gas JV
- Test-bed for CO₂ Monitoring Technologies \$30mm+ Research Project *"in the field"*

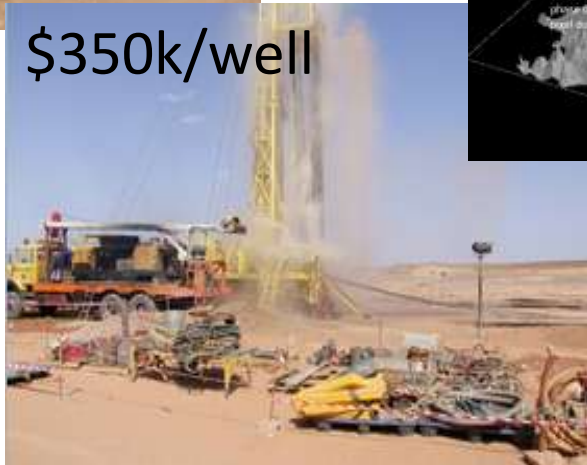
Monitoring CO2 Injection: different scales & costs



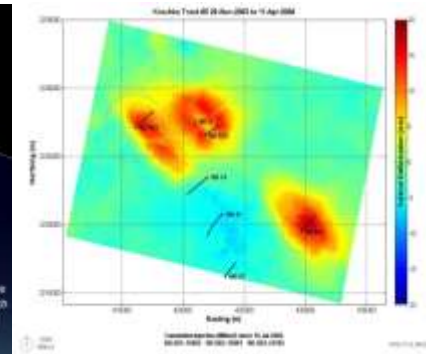
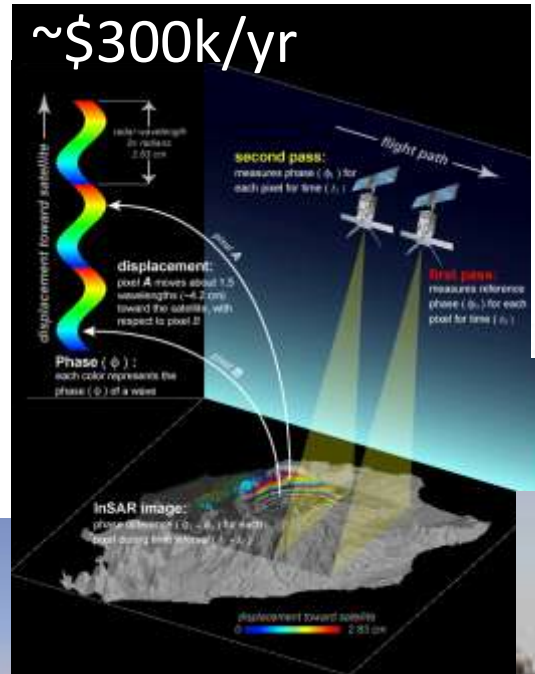
\$100/sample



\$350k/well



~\$300k/yr



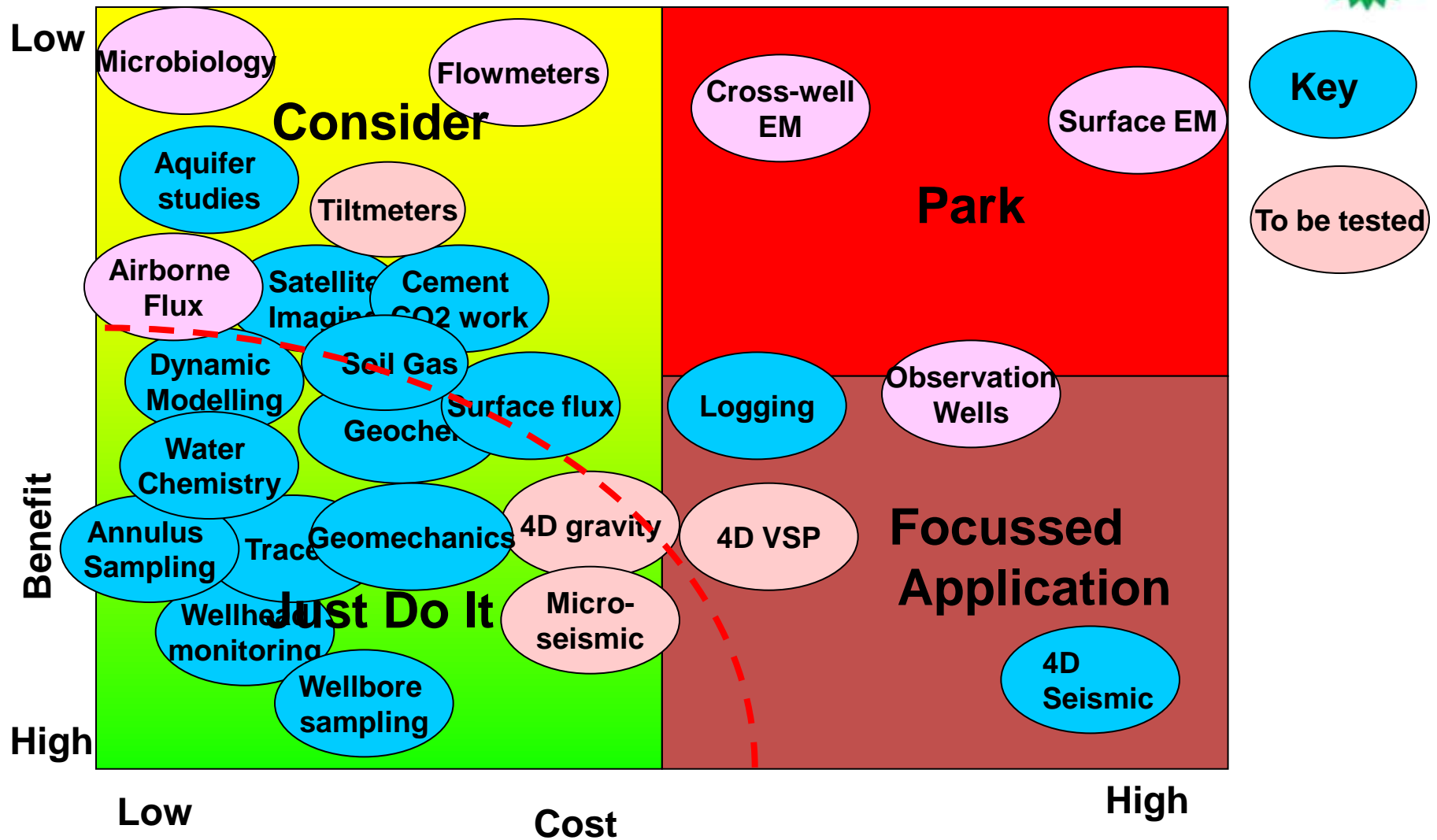
\$10MM/Survey



Scale and Cost : but each has own merit & value

In Salah Monitoring Technologies: Evaluation

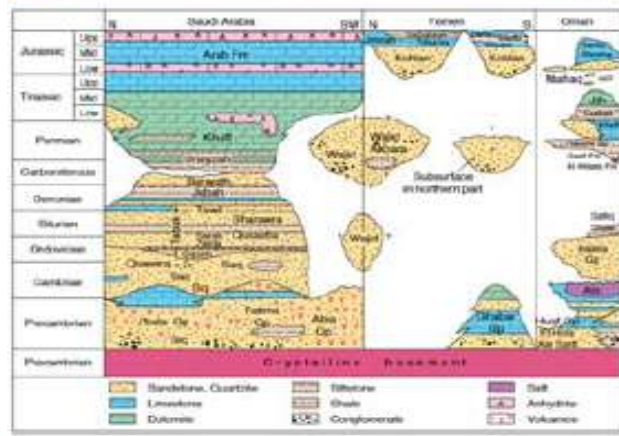
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To finish ...

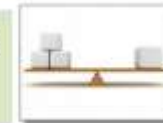


Skills Resources



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