



GA Environmental Conference

Nick Irvin, PE
SCS R&EA
August 28, 2009



The New Math.....



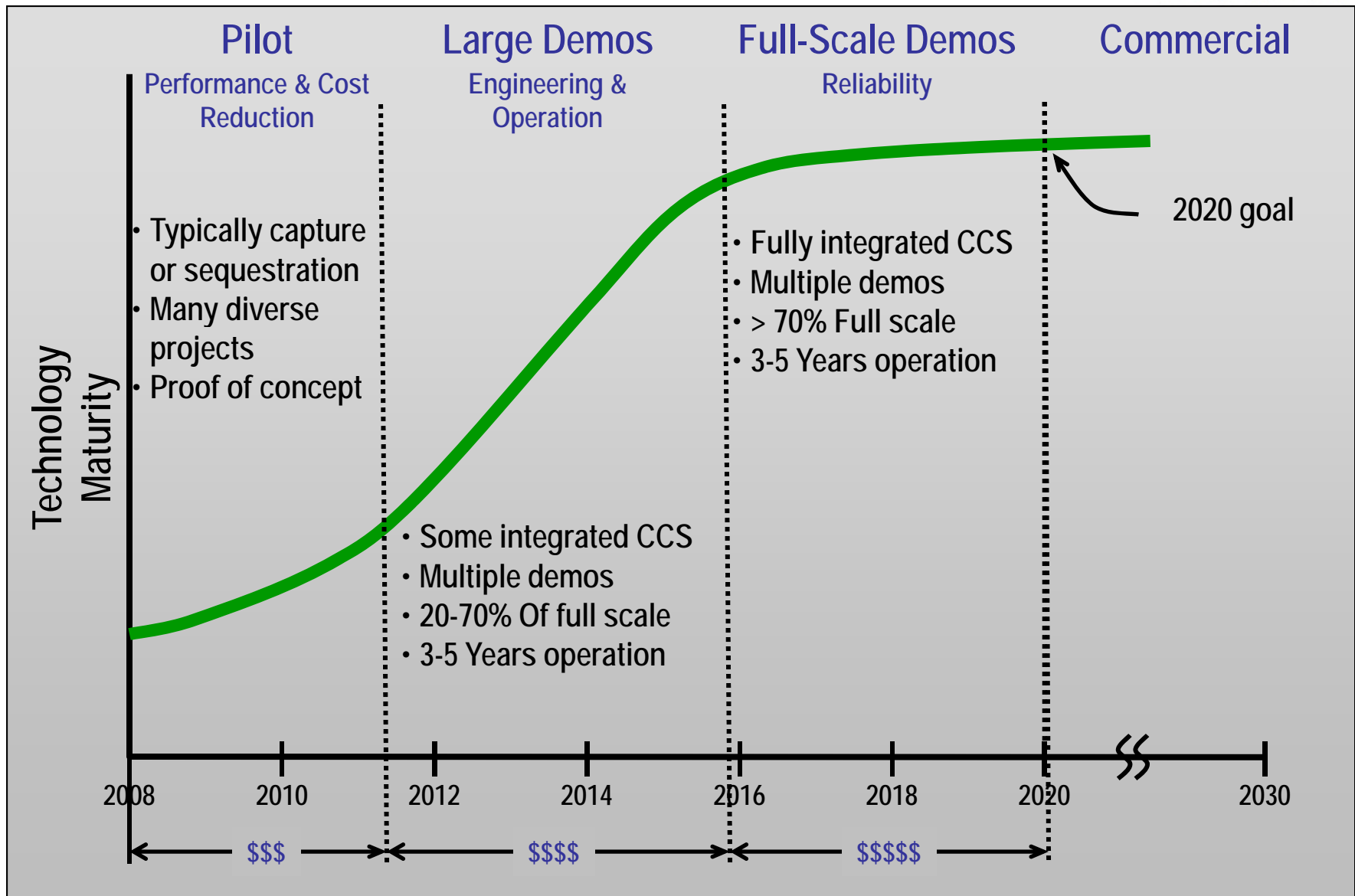
- CO₂ is not SO₂

	Concentration	Emissions Rate	Impact to Dispatch
SO ₂	400-3000 ppm	0.5-5 lb/mmBtu	~\$4.5/MW hr
CO ₂	10-14%	200 lb/mmBtu	~\$40/MW hr

- So for a 1000 MW unit.....

	Emissions Rate	Tons per year
SO ₂	3 lb/mmBtu	130k
CO ₂	200 lb/mmBtu	9,000k

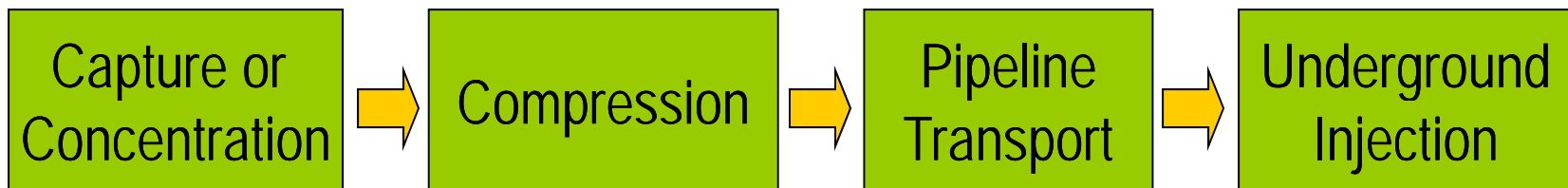
CCS Technology Development Path



CO₂ Capture and Sequestration Technology



- **CCS is a four-step process**
 - Pure CO₂ captured or concentrated
 - Compressed to ~100 atm (~1500 - 2200 psi)
 - Transported to injection site
 - Injected deep underground into geological formations and sequestered safely for thousands of years



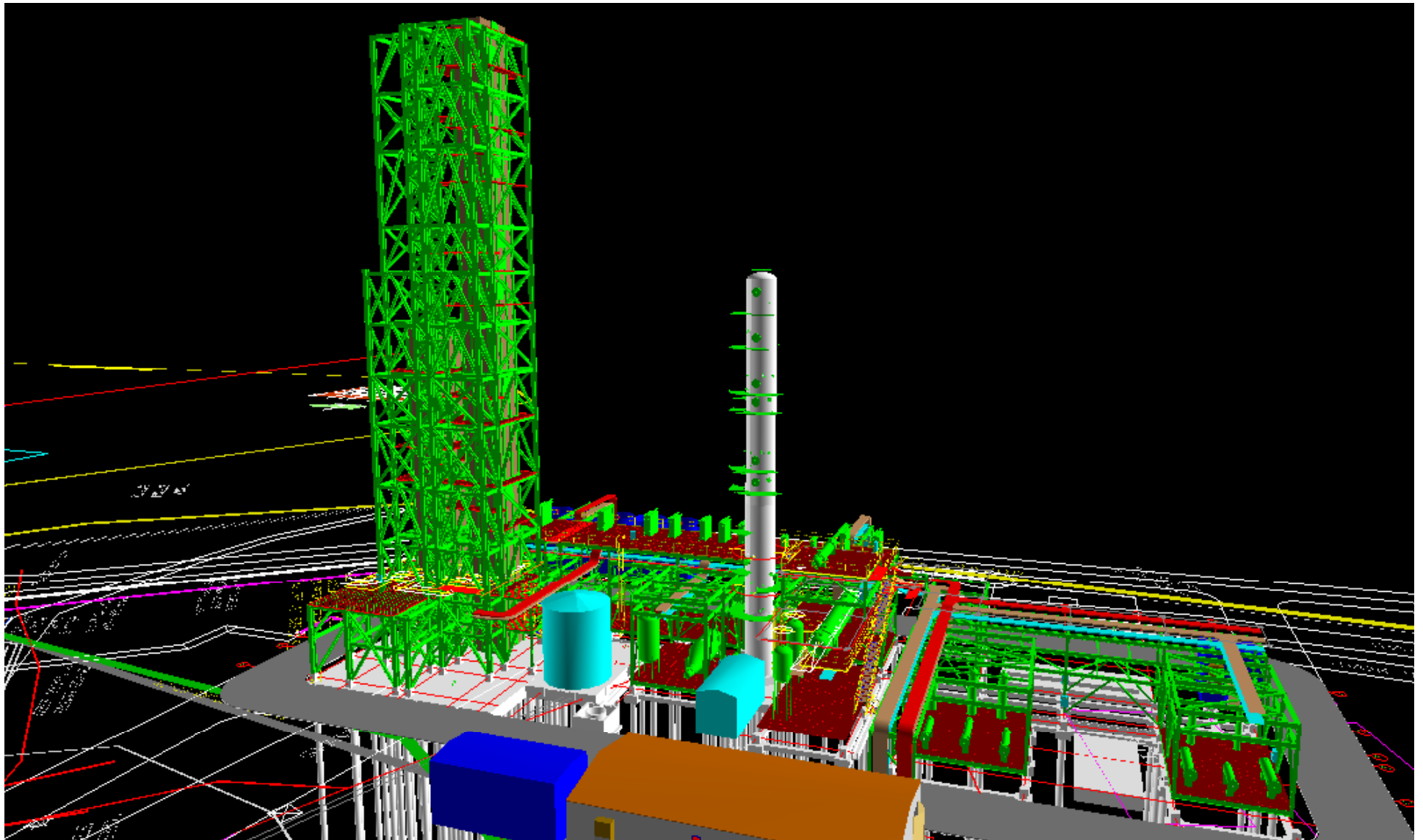
25 MW Demo – Key Deliverables



- Design, build, operate 25 MW CO₂ capture and compression plant
 - MHI KM-CDR capture process
 - Integrated to existing “flagship” unit – Barry Unit 5
- Permit, “construct”, operate, monitor, and verify large scale geologic sequestration
 - DOE sponsored SECARB Phase III project
 - Injection – 4 years, 100-150k mtpy
 - Monitor and verify – 4 years
- Provide PC CCS technology validation, cost, deployment data to support strategic generation planning needs

Not a pilot facility.....

SOUTHERN
COMPANY



The New Math.....Revisited



- CO₂ is not SO₂

	Concentration	Capital	Heat Rate impact
SO ₂	400-3000 ppm	\$300/kW	~2%
CO ₂	10-14%	\$1500/kW	~25%

- So for a 1000 MW unit.....

	Capital Cost	Station Service
SO ₂	\$300M	20 MW
CO ₂	\$1,500M	250 MW