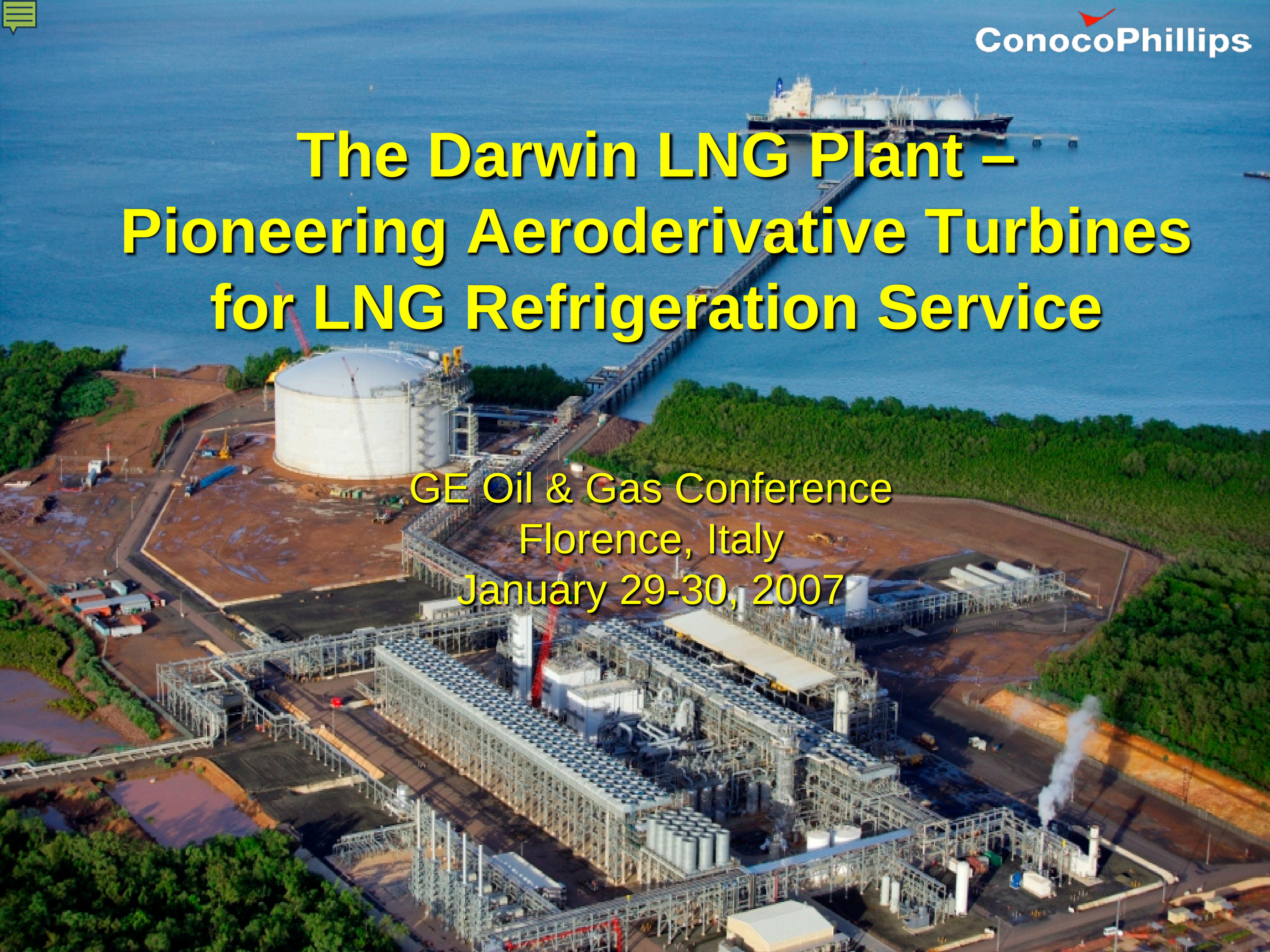
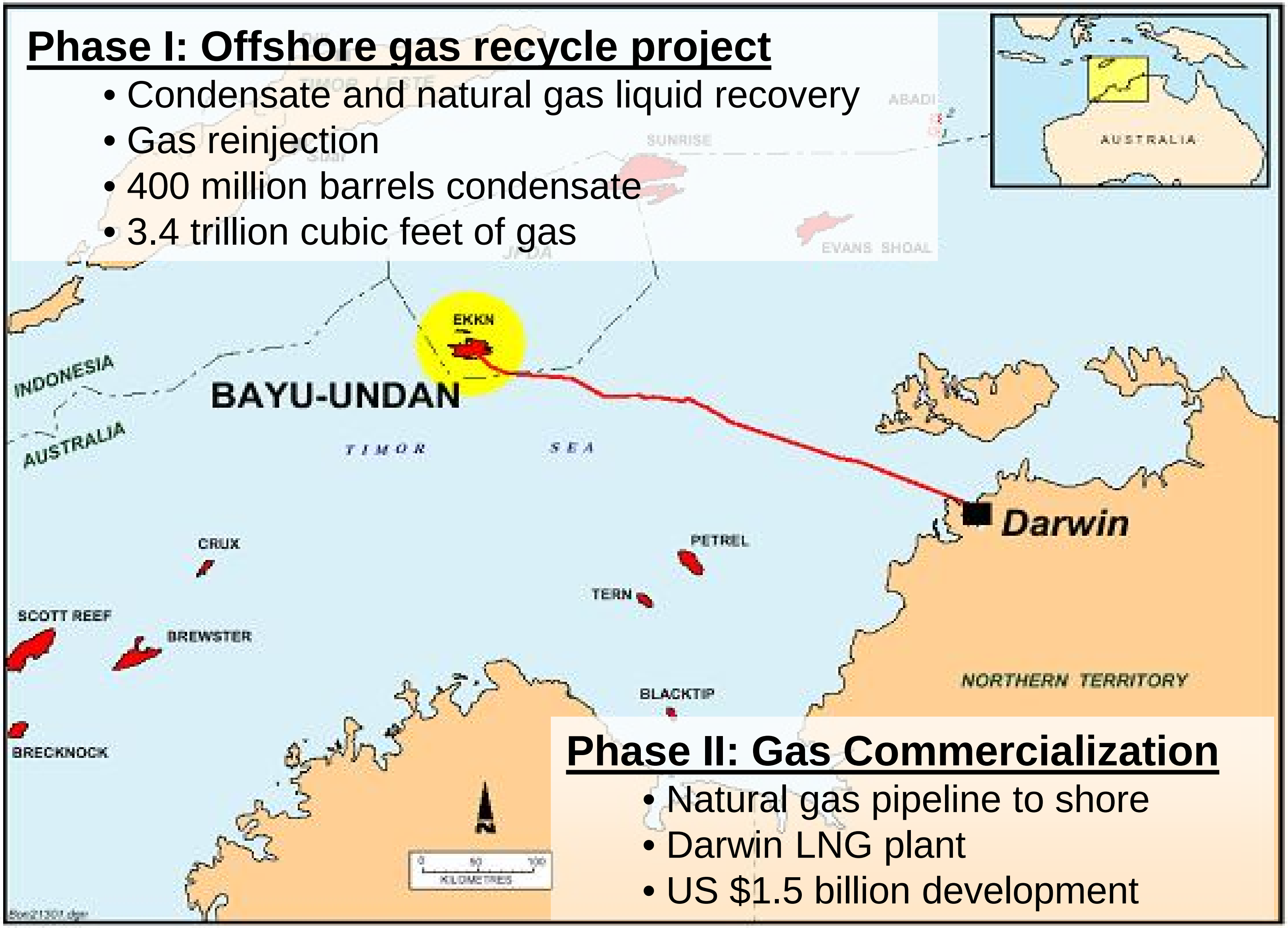
ConocoPhillips



The Darwin LNG Plant – Pioneering Aeroderivative Turbines for LNG Refrigeration Service

GE Oil & Gas Conference
Florence, Italy
January 29-30, 2007

Bayu-Undan Development



Phase I: Offshore gas recycle project

- Condensate and natural gas liquid recovery
- Gas reinjection
- 400 million barrels condensate
- 3.4 trillion cubic feet of gas

Phase II: Gas Commercialization

- Natural gas pipeline to shore
- Darwin LNG plant
- US $1.5 billion development

Kenai, Alaska

Darwin Design Requirements

- Reliable plant design
- Short and certain schedule
- Cost certainty
- Safe and efficient
- Low carbon dioxide emissions

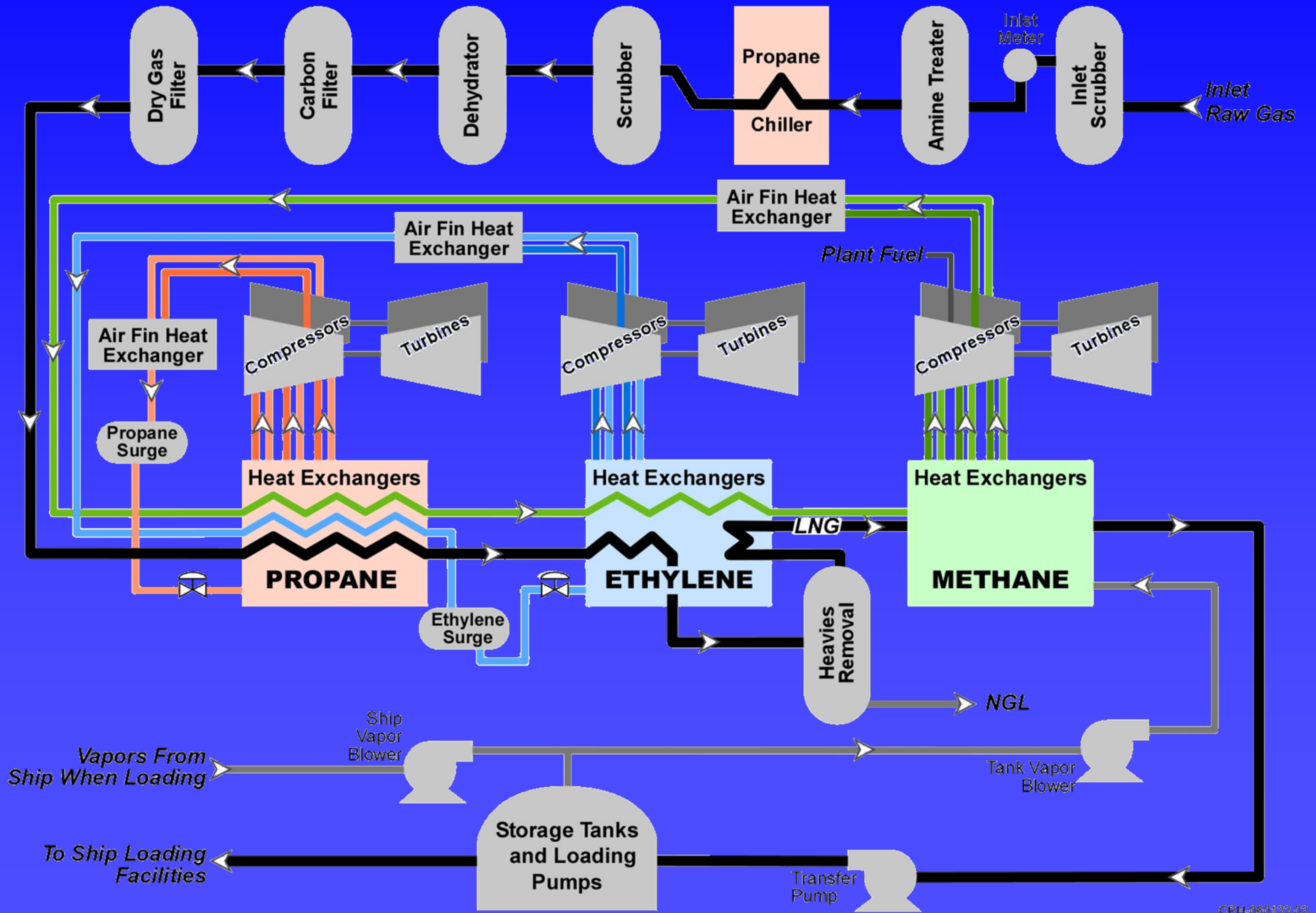
Discovery to LNG

- **1995** — Bayu-Undan field discovered
- Delineation drilling
- **1999** — LNG marketing begins in earnest
- **2000** — Recycle gas project approved
- **2002** — LNG sales agreement heads of agreement signed
- **June 2003** — Bechtel given notice to proceed
- **Feb 2004** — Bayu-Undan began production
- **Feb 2006** — First LNG cargo loaded (32 months from notice to proceed)

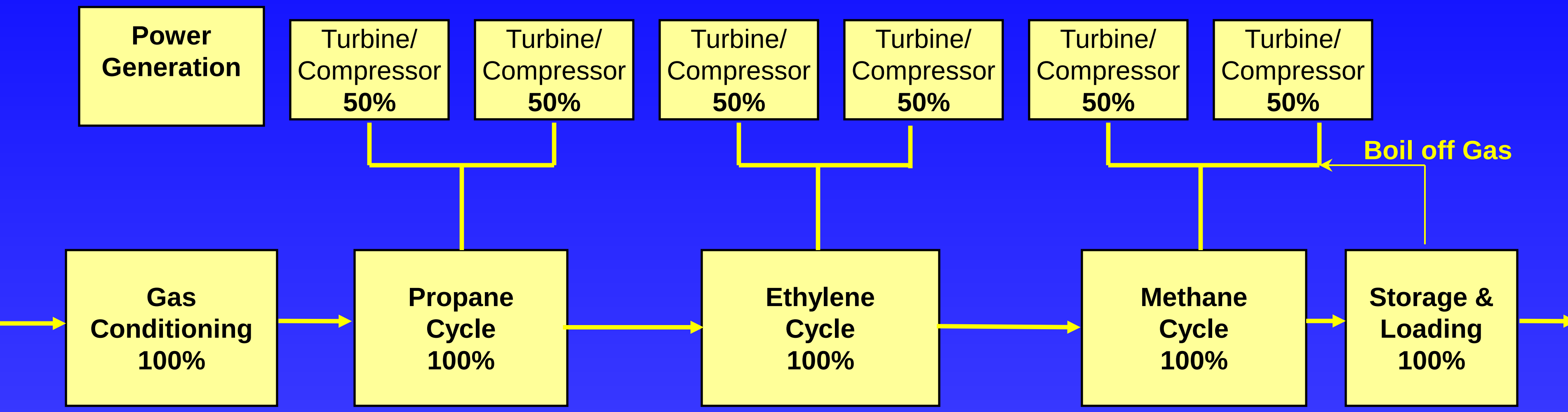
Darwin LNG Features

- 3.7 million tonne per annum capacity
- Optimized Cascade^{SM} LNG process
  - Two-in-one turbine design
- Inlet gas in carbon dioxide and nitrogen is high
- Based upon ConocoPhillips-Bechtel Collaboration
  - Bechtel performed design and EPC
  - Lump sum turn key approach
- Completed ahead of schedule and on budget
- LNG marketed to Tokyo Gas and Tokyo Electric

The Optimized Cascade℠ Process



COP Two-Trains-in-One Approach



Overall Plant Production Efficiency **>95%**

<u>Operating Range (% of design)</u>

- **Full Plant** **80 – 105%**
- **One Turbine Offline** **60 – 80%**
- **Three Turbines Offline*** **30 – 60%**

  ***At least one turbine on each cycle must be operating**

- **Plant Idle** **0 – 30%**

Maximum plant availability with operating flexibility

Darwin Firsts

- Aeroderivative turbines for refrigeration
  - Water injection for low NOx
  - Media based evaporative cooling for power augmentation
- Integrated nitrogen rejection facilities
- Process heat supplied from turbine exhaust
  - Amine regeneration
  - Molecular sieve regeneration
  - NGL recovery system
  - Inlet gas pre-heater
- Propane sub-cooling integration
- Loading and vapor lines of vacuum insulated pipe

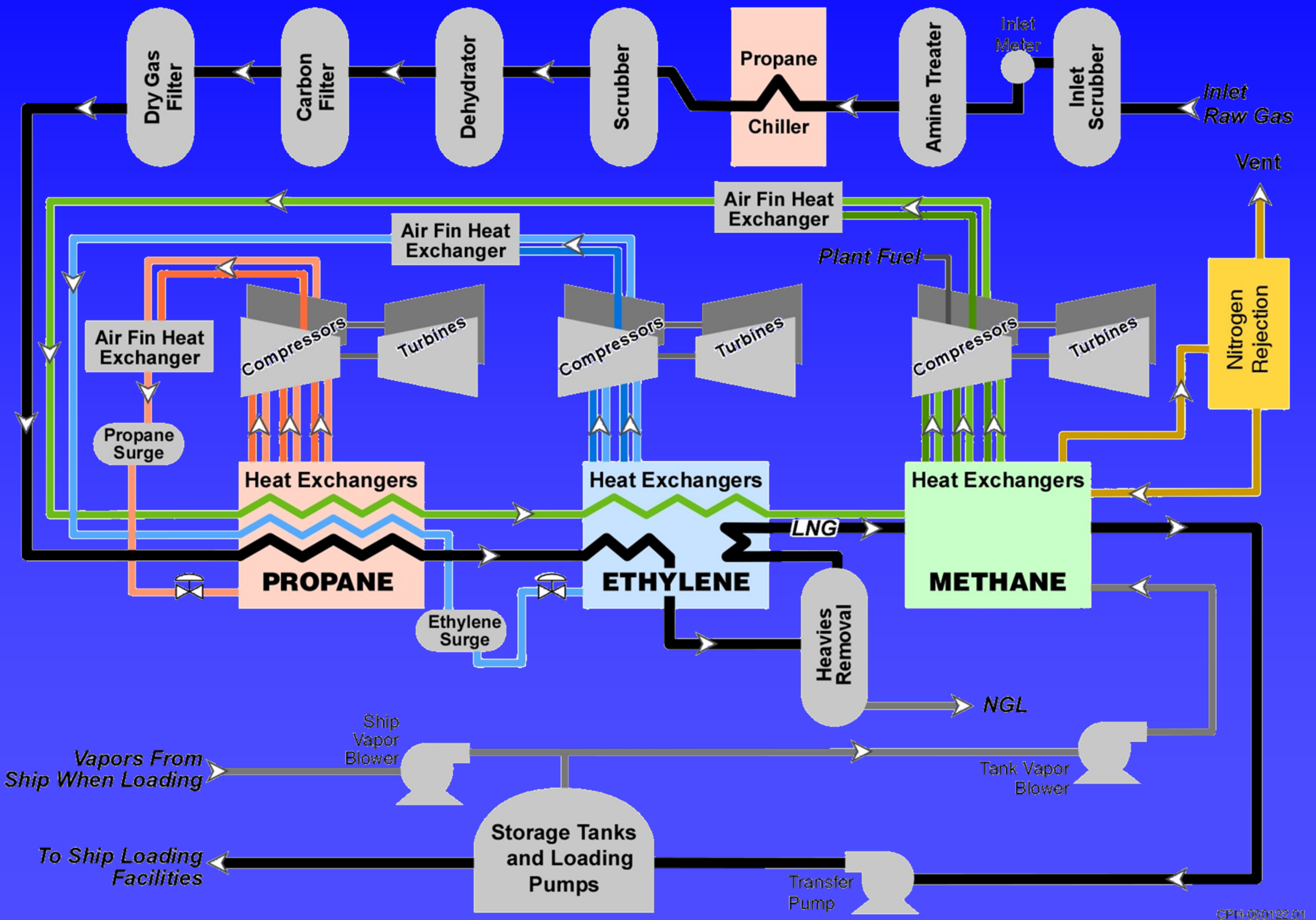
Advantages of Aeroderivatives

- Low fuel consumption
  - Lower fuels costs, more LNG
  - Less carbon dioxide emissions
- High availability
  - Turbine replacement in a few days, rather than weeks
- Lower weight
  - Less handling equipment
- Two shaft machines provide operating flexibility
  - Excellent starting torque
    - Startup under settle out conditions
  - Wide speed range provides flexibility

Advantages of Aeroderivatives in the Optimized Cascade Process

- Available turbine sizes match those used in process
- Short scheduled maintenance periods
  - Plant continues to operate with one or more units down
- Plants operate well at 0 to 100% of capacity
  - Turbine maintenance can be opportunistic
- No starting motors required
  - Small power generation requirement

The Darwin Process

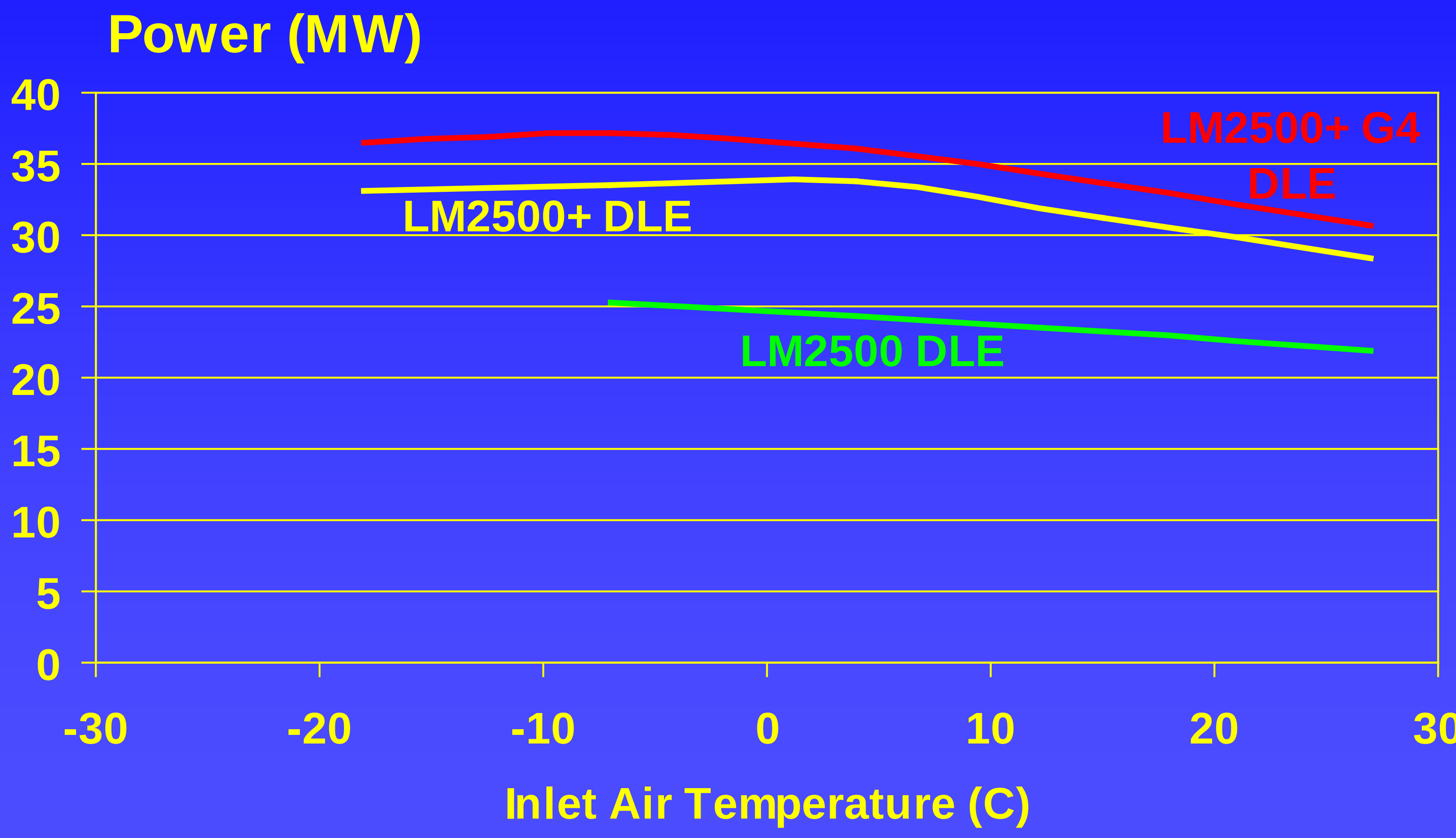


Representative Turbine Performance

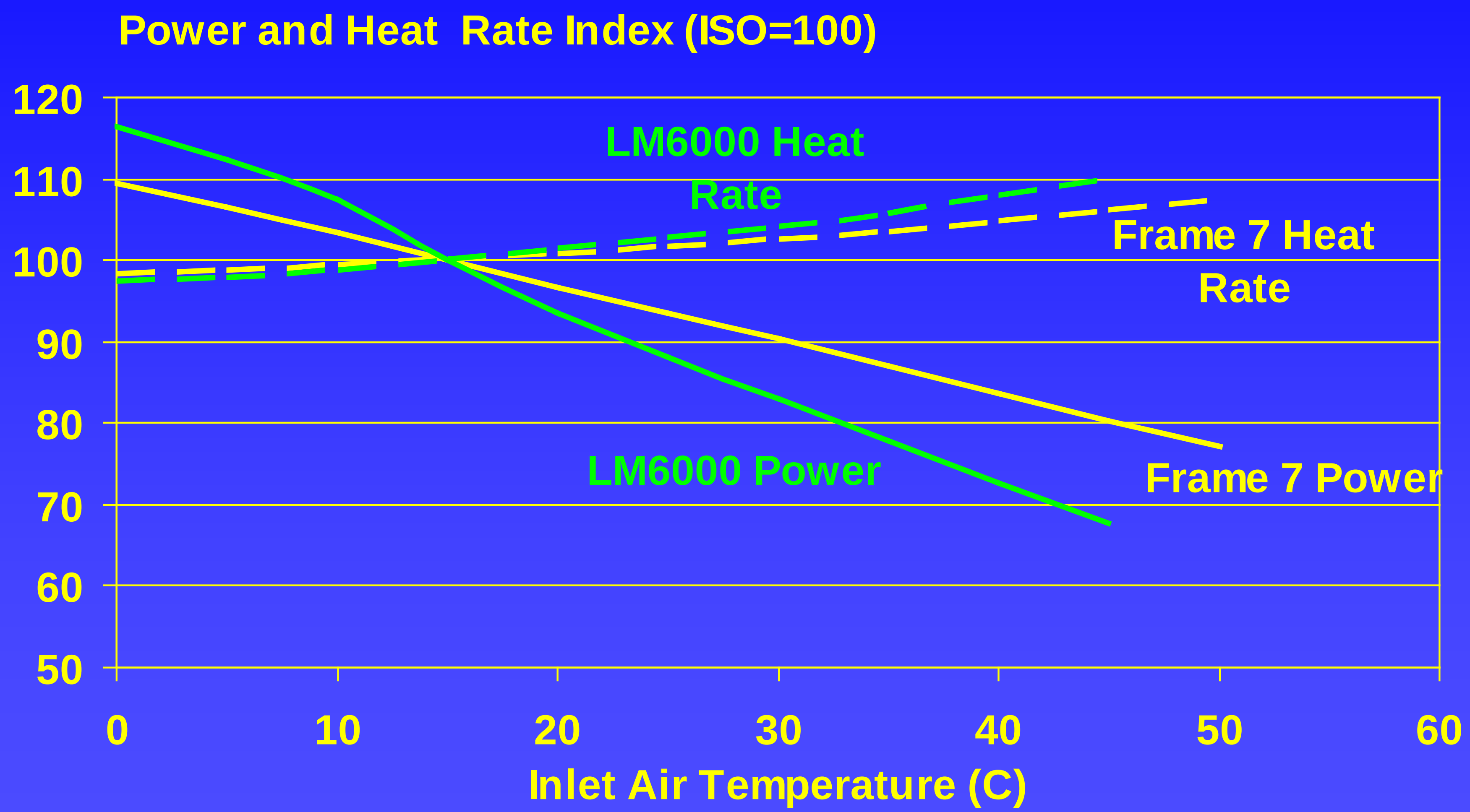
Turbine	Shaft	Power (kW)	Efficiency	Fuel Consumption (Indexed)	Scheduled Downtime
Frame 5D	Dual	32,580	29.4%	100	2.6%
LM2500+	Dual	31,364	41.1%	72	1.6%
LM6000	Dual	44,740	42.6%	69	1.6%
Frame 7E	Single	86,225	33.0%	89	4.4%
Frame 9E	Single	130,100	34.6%	85	4.6%

Values are representative

Impact of Ambient Temperature on LM2500 Turbines

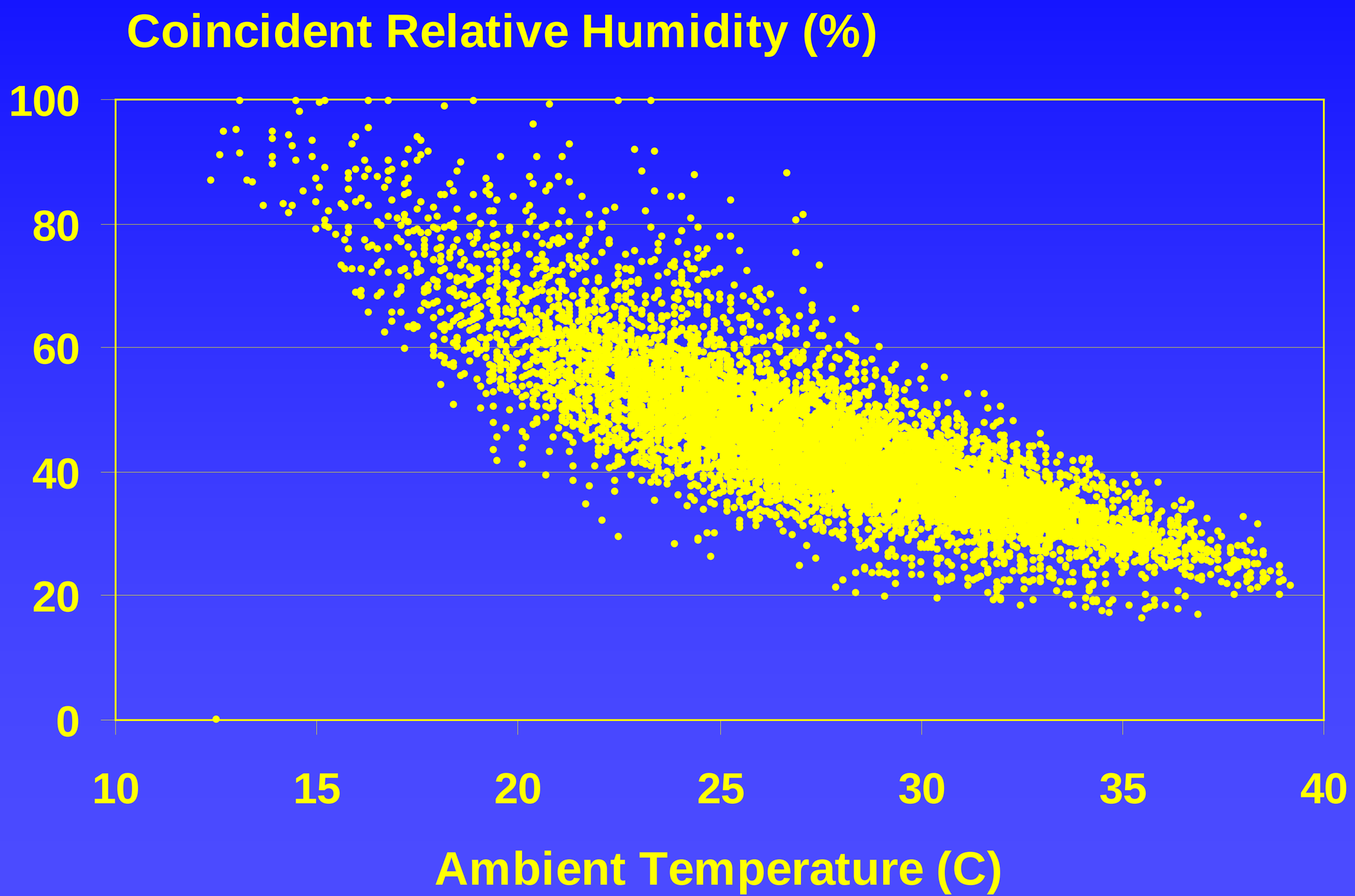


Turbine Performance



Aeroderivatives are more sensitive to ambient conditions

Darwin Ambient Conditions



Coincident hot and dry conditions occur frequently

Future Improvements

- Upgrade to LM2500+ G4
  - Additional 10% power
  - Less sensitive to high ambient conditions
- New turbine possibilities
  - LM6000
- Additional inlet air cooling strategies
- Use in floating LNG

Aeroderivative Plant Configurations

Turbine (No. x Model)	Number of Turbines By Service (Propane/Ethylene/Methane)	Nominal Train Size (MTPA)
6 x LM2500+	2 / 2 / 2	3.5
8 x LM2500+G4	3 / 3 / 2	5
6 x LM6000 DLE	2 / 2 / 2	5
9 x LM6000 DLE	3 / 3 / 3	7.5

First Year Performance

- First LNG two months ahead of schedule
- Few issues during turbine startup
- LNG production in 2006 exceeded target
- Plant production efficiency exceeded 95% since turnover

Summary

- Darwin LNG has met the goals
  - On time
  - On budget
  - Reliable
  - Efficient
- New technology deployed at Darwin and extensions of them are available for future plants
  - Aeroderivatives
  - Inlet air humidification
  - Nitrogen rejection units
  - Propane sub-cooling integration


Thank You