

*Launching a New Investment Initiative:
The Next Generation Clean
Carbon/Coal and Hydrocarbon
Upgrading Technologies*

**Highlights for
Executive Breakfast Meeting**

16 November, 2006

Alberta's Value Added Vision

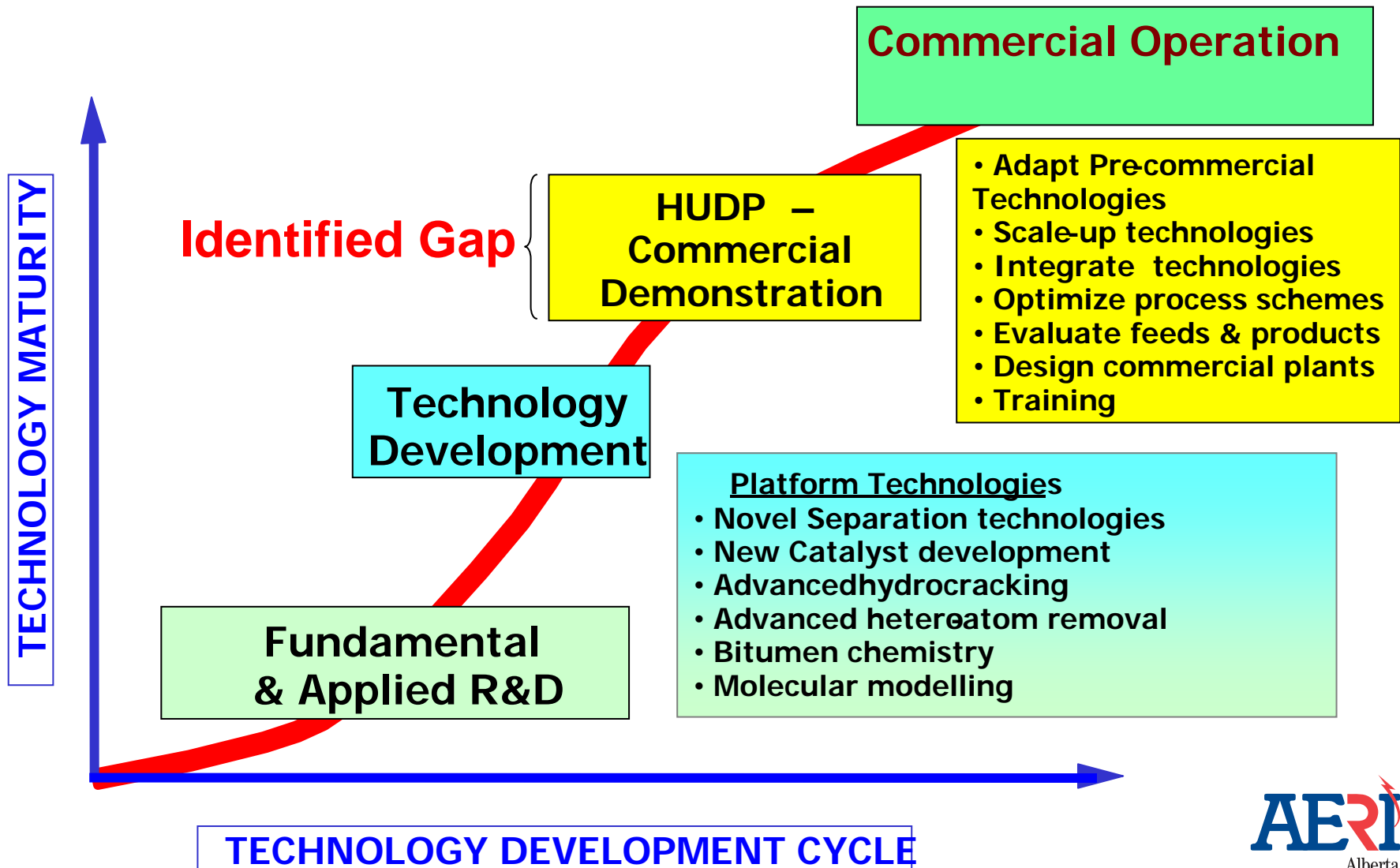
“By 2020 Alberta has a sustainable competitive hydrocarbon industry that expands the market for Alberta’s energy resources and produces higher value products in Alberta with minimum environmental impact”

- Research and innovation are central to achieving Alberta’s sustainable energy goals and fundamental to Alberta’s continued prosperity.
- We must begin now to radically transform our energy system to improve the efficiency with which we produce and convert energy resources to value-added products and minimize emissions including CO₂.
- No one group can do it alone
- Requires the combined effort and investments of both the public and private sectors to share the risk and focus on the key technologies and environmental challenges

Background

- In early 2005 Hydrocarbon Upgrading Task Force Workshops identified critical needs for a sustainable energy future:
 - ❑ next generation upgrading technologies
 - ❑ skilled personnel
- Industry-Government Working Group developed the vision and phased implementation plan for establishing a Hydrocarbon Upgrading Program (HUDP) with a strong training component
 - ❑ Modeled after Underground Test Facility (UTF) in 1980's
 - Government's investment through AOSTRA was key to timely commercialization of SAGD technology and training skilled personnel*
- HUDP Phase 1 screened 100 processes and selected an initial set of technologies with best potential for further development
- Now starting next phase: Develop and demonstrate next generation "clean" upgrading technologies
 - Invite expressions of interest for a new initiative: "Next Generation Clean Carbon/Coal and Hydrocarbon Upgrading Projects"*

Filling the Gap- Demonstrate Commercial Readiness



HUDP Vision and Goals

Vision

Alberta is a world leader in demonstrating and commercializing radically new integrated technologies that:

- ❑ maximize the value of carbon and bitumen as abundant and competitive sources of ultra-clean fuels, specialized chemicals, petrochemicals, and power
- ❑ minimize environmental impacts
- ❑ Provide hands-on training for skilled industrial personnel

Goals

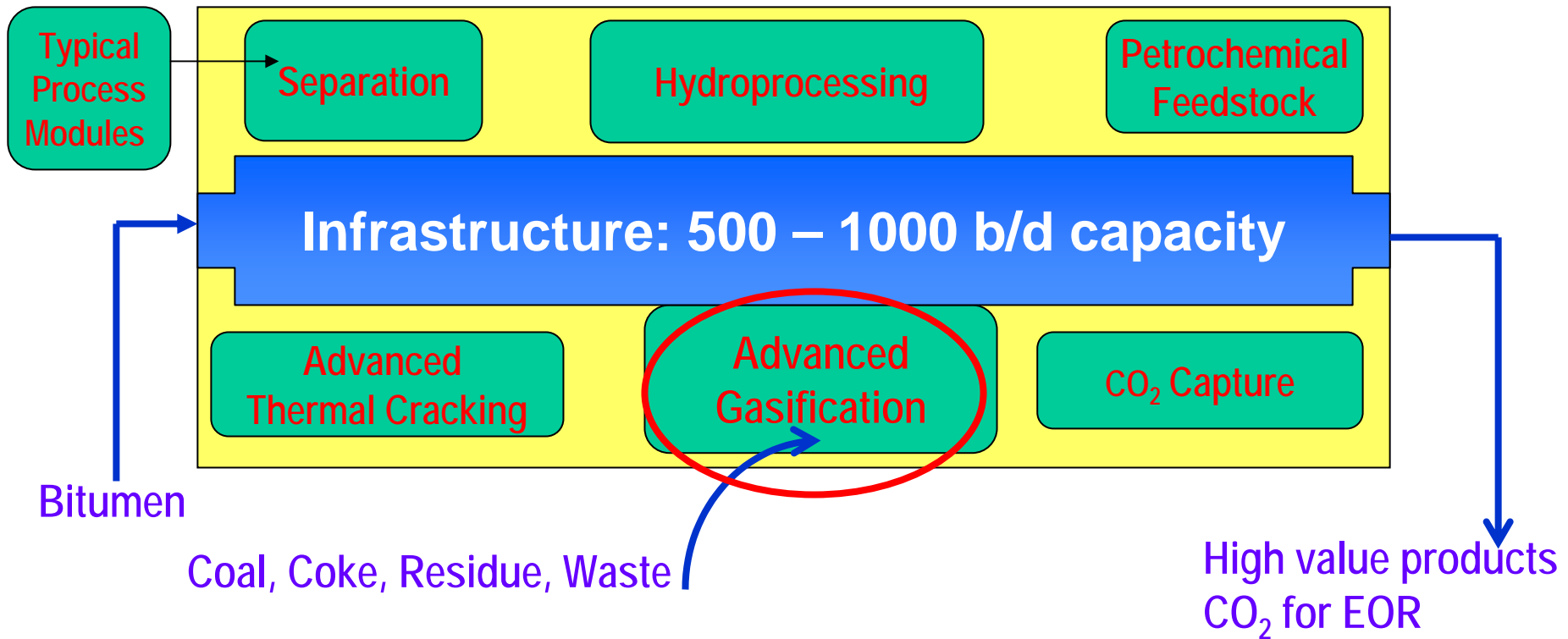
- ❑ Accelerate the pace of the development, demonstration and commercial deployment of next generation upgrading technologies
- ❑ Build capacity in Alberta for the timely adaptation, development and demonstration of upgrading and technologies to achieve Alberta's Integrated Energy Vision

Path Forward

- The Alberta Department of Energy and Alberta Innovation and Science, through the Alberta Energy Research Institute (AERI), invite expressions of interest from the private sector for a new initiative: “Next Generation Clean Carbon/Coal and Hydrocarbon Upgrading Projects” .
- The Alberta government is prepared to provide up to \$100 million over the next 5 years and is looking for the same level of commitment from the private sector for this initiative
- The program could be of particular interest to companies planning future expansions and wishing to share the risk of demonstrating commercial readiness of new and improved innovative upgrading technologies and next generation gasification technology

Demonstration Program Concept

Clean Carbon and Value Added Upgrader for the Future



Features

- ❑ Incremental modular development at existing or greenfield sites
- ❑ Companies participate in modules they need

Benefits

- ❑ Demonstrate advanced technologies
- ❑ Modular plug-and-play capability
- ❑ Integration synergies
- ❑ Natural gas replacement
- ❑ CO₂ and emissions technology
- ❑ Training

Business Guiding Principles

- Cost sharing: A government/industry cost sharing formula will be developed for each project
- Ownership: Plant and facilities owned and operated by the private sector participants.
 - ❑ After meeting projects goals facility made available to other users, and for training purposes at commercial terms
- Intellectual property
 - ❑ Background IP remains with original owner of the IP.
 - ❑ IP developed as part of co-funded activities is owned by the private sector participants with an obligation to commercialize the technology in Alberta within 5 years⁽¹⁾
 - ❑ If not commercialized after 5 years⁽¹⁾ the technology made available to other Alberta users under normal commercial licensing terms

⁽¹⁾ term negotiated by parties

Follow-Up

- Please submit letters of expression of interest with a short description of the proposed project to:

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