



the Energy to Lead

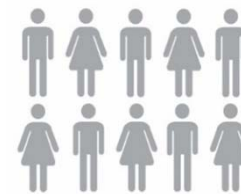
Shale Gas Innovation and Workforce Development

15th US-China Oil & Gas Industry Forum
September 18, 2015
Chongqing, China

Company Overview

ESTABLISHED 1941

- > Independent, not-for-profit established by the natural gas industry
- > GTI tackles tough energy challenges turning raw technology into practical solutions
- > Downhole to the burner tip including energy conversion technologies



292
EMPLOYEES



RESEARCH &
DEVELOPMENT



PROGRAM
MANAGEMENT



TECHNICAL/
ANALYTICAL



CONSULTING



TRAINING

Addressing Key Issues Across the Energy Value Chain

REDUCING CARBON EMISSIONS TO THE ENVIRONMENT

SUPPORTING SUSTAINABLE ECONOMIC GROWTH



Expanding the supply of clean, abundant, and affordable natural gas

Ensuring a safe and reliable energy delivery infrastructure

Promoting the clean and efficient use of energy resources

Topics

> Technology and Information Development

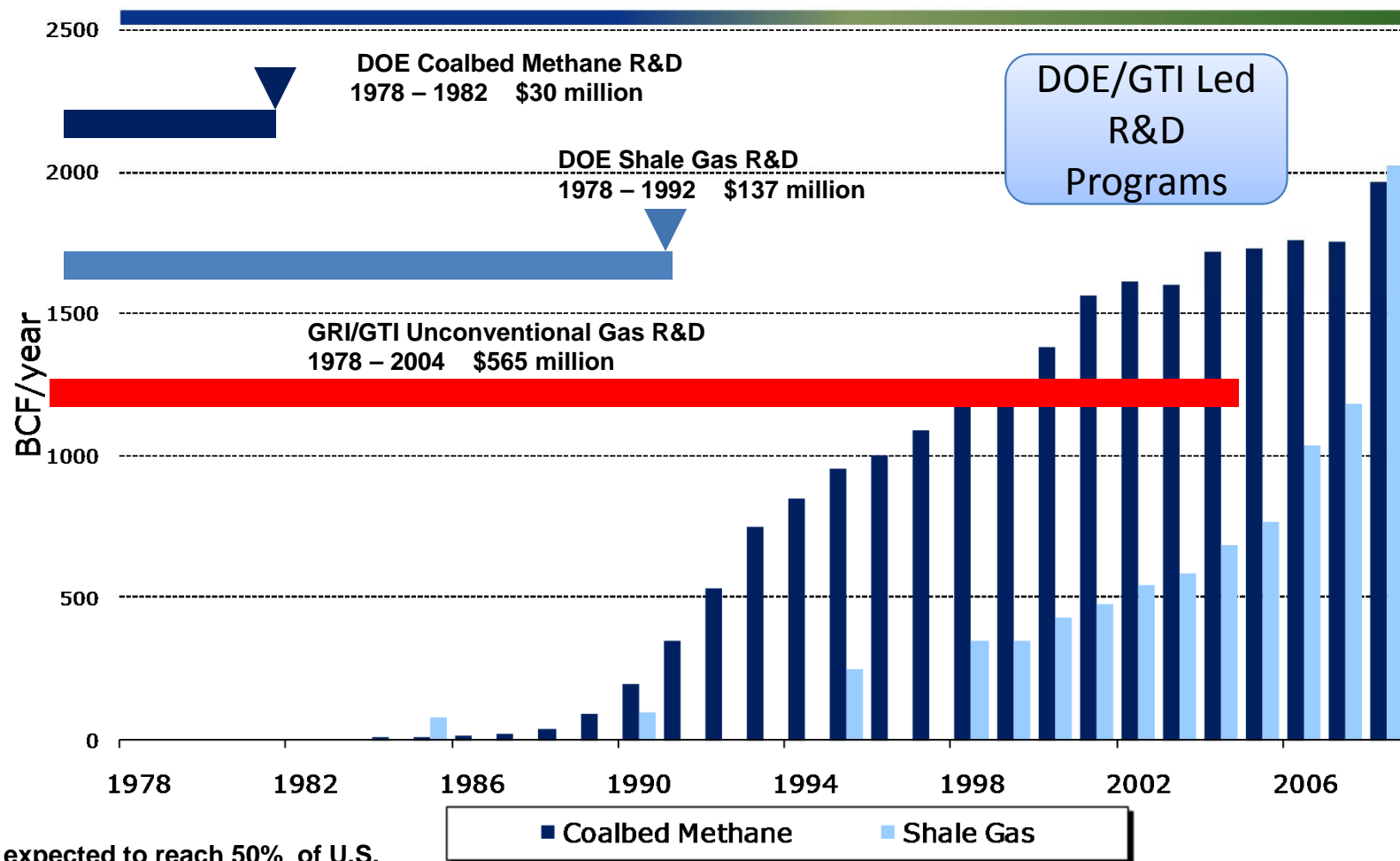
- Investment in Shale Gas Technology
- Current Research and Technology Development
- Hydraulic Fracturing Test Site (HFTS)

> Technology and Information Dissemination

- Blended Learning in the Gas Industry
- Upcoming Shale Gas Training Opportunities

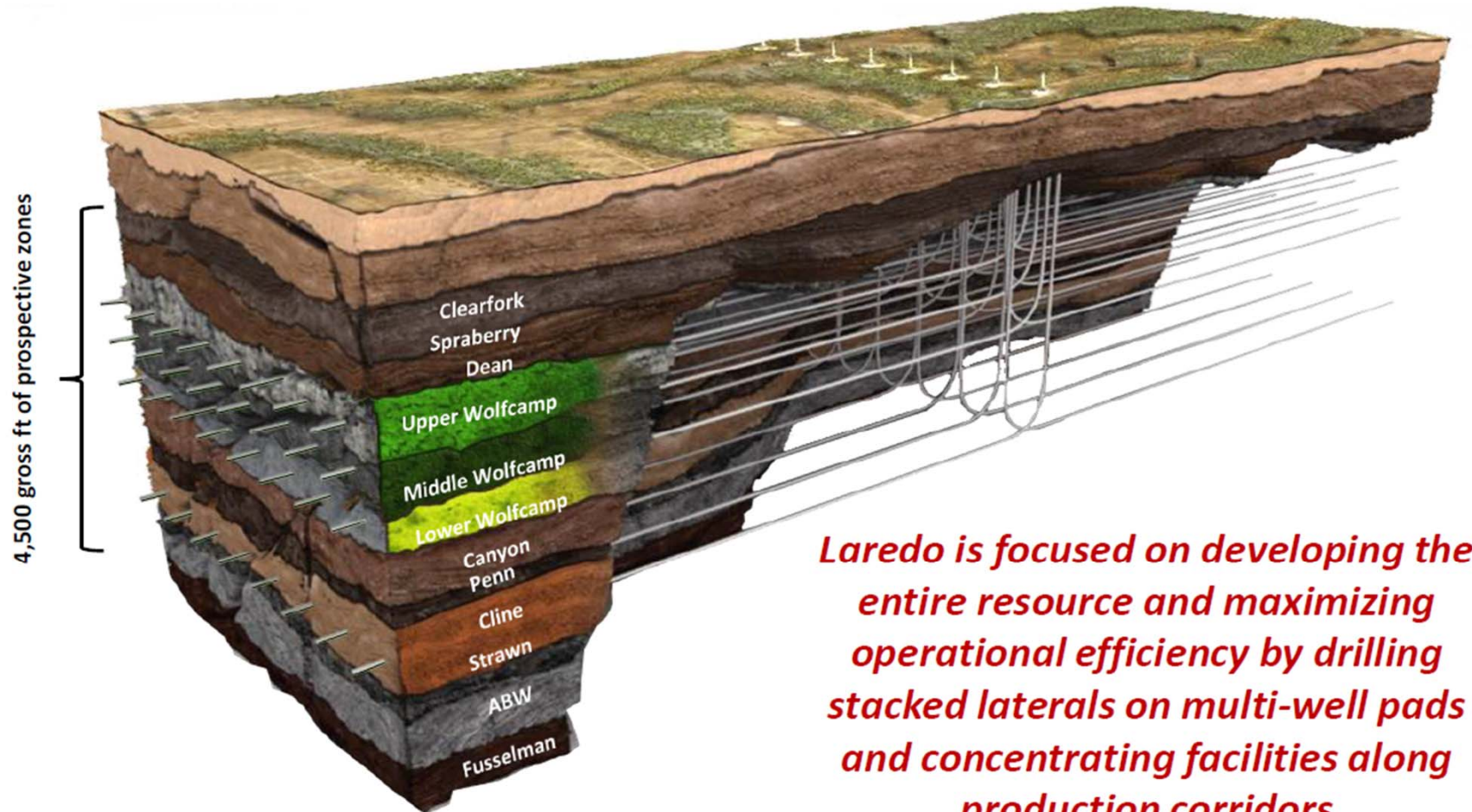
Investment in Shale Gas

--- Revolution or Evolution? ---



Shale expected to reach 50% of U.S. gas production by 2035

Stacked Pay Development in the Permian Basin



Laredo is focused on developing the entire resource and maximizing operational efficiency by drilling stacked laterals on multi-well pads and concentrating facilities along production corridors

Ref: Laredo Petroleum Corporate Presentation - June 2015

HFTS - Operations Update

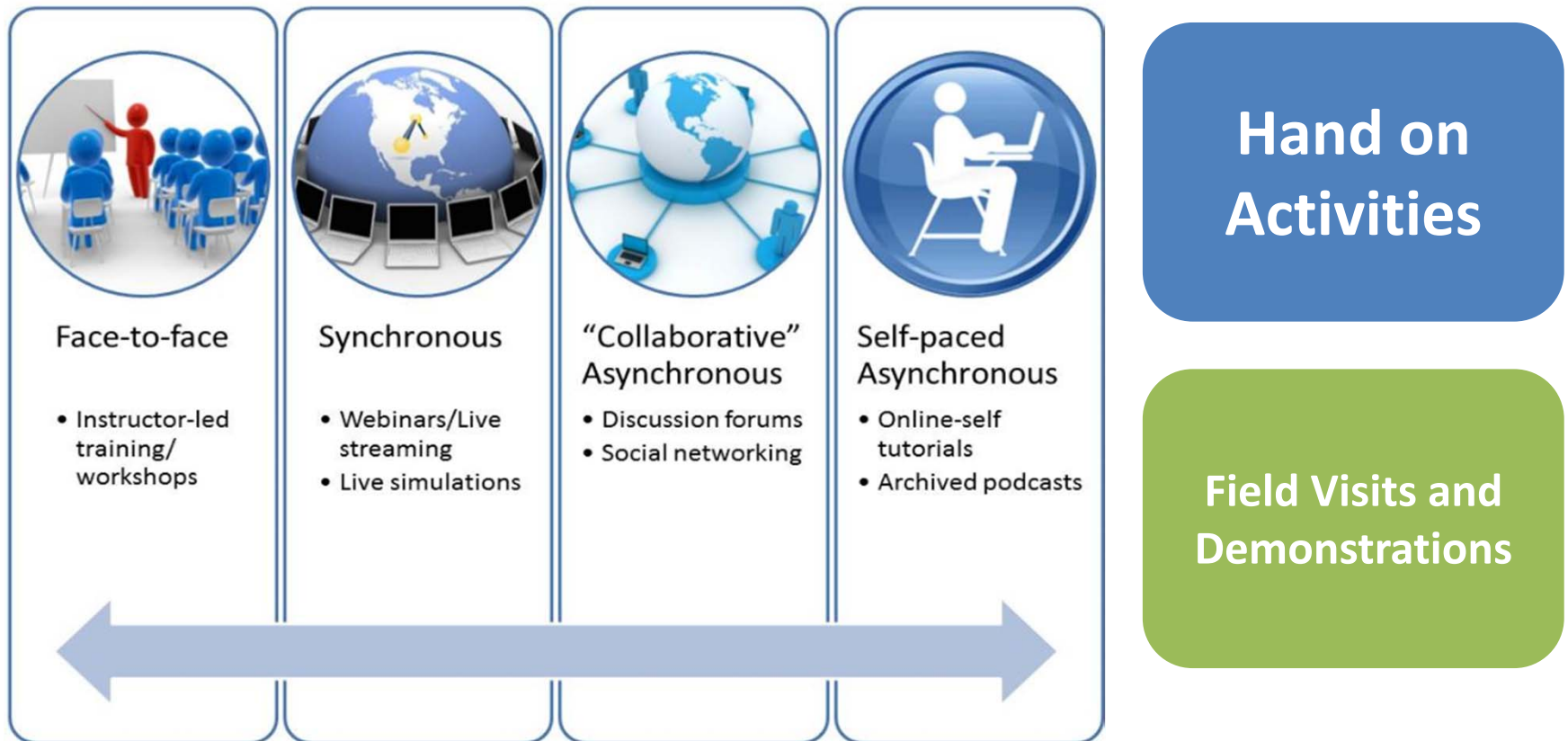
- > Horizontal Open Hole Log (HOHL) - image and quad combo
 - Sonic, density, porosity, resistivity, gamma
- > Vertical pilot hole
 - Sidewall cores, image + quad combo, 10 micro DFIT
- > X-Well seismic, microseismic, bottomhole pressure gauges, coil fiber
- > Core well through fracture domain
 - Whole cores
 - Image log
 - Pressure sensor modules

GTI Education Programs

- > GTI energy industry training programs
 - Over 40 courses offered annually
 - Over 70,000 students trained
- > Broad array of topic areas
 - Gas distribution and transmission
 - Gas utilization and marketing
 - LNG
 - E&P
- > Delivery options
 - Classroom courses or open enrollment
 - Online and self-guided programs
 - Blended learning



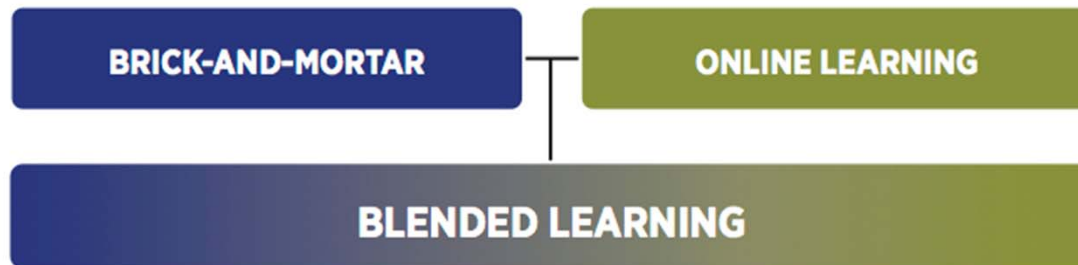
Learning Approaches



What is Blended Learning?

An education program in which a student learns:

1. In part through online learning
2. In part in an instructor-led (brick-and-mortar) location
3. Both approaches are connected to provide an integrated learning experience.



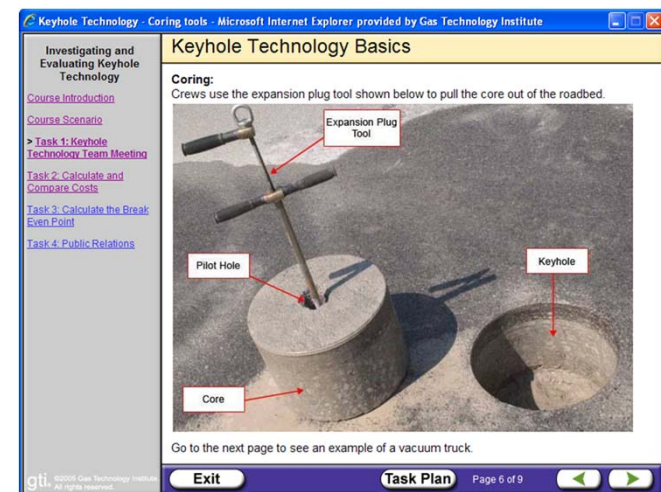
Gas Industry Applications for Blended Learning

> Audiences

- Remote E&P and LNG facility staff
- Pipeline service technicians
- Facility operating staff

> Applications

- Field skills for industry technicians
- Introduction of new technology and processes
- Just-in-time training to solve a problem or gain an update
- Operating manuals and reference guides
- Checklists for regulatory compliance



Upcoming Training Opportunities

> Shale Exchange

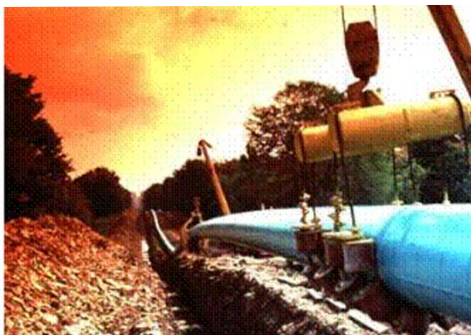
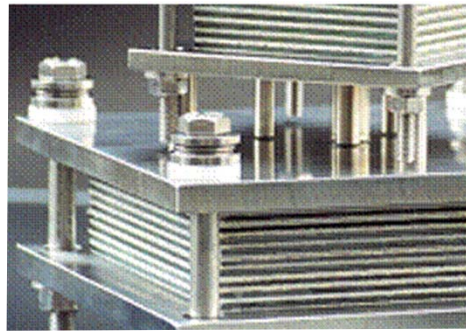
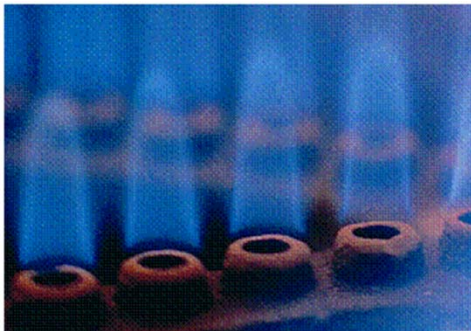
- International shale development
- Technical tours and site visits
- October 20-22
- Pittsburgh, USA



> U.S.-China Shale Gas Training Program

- Sponsored by USTDA in cooperation with NEA
 - > Workshop 1: Beijing, December 3-4, 2015
 - > Environmental standards and technology

Tackling Important Energy Challenges and Creating Value for Customers in the Global Marketplace



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