

Developing the Next Generation of Completion Engineers

Mark Van Domelen
Downhole Chemical Solutions



Society of Petroleum Engineers
Distinguished Lecturer Program
www.spe.org/dl



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The Society is grateful to those companies that allow their
professionals to serve as lecturers

Additional support provided by AIME



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SPE Distinguished Lecturer Program

- I. Founded in 1961 (with 3 lecturers)
- II. Committee has 40 members from around the world
- III. Rigorous selection process (200 nominations, 100 applications, 50 Potential lecturers, 32 selected as DLs for 2018)
- IV. DLs travel to various SPE sections around the world

Agenda



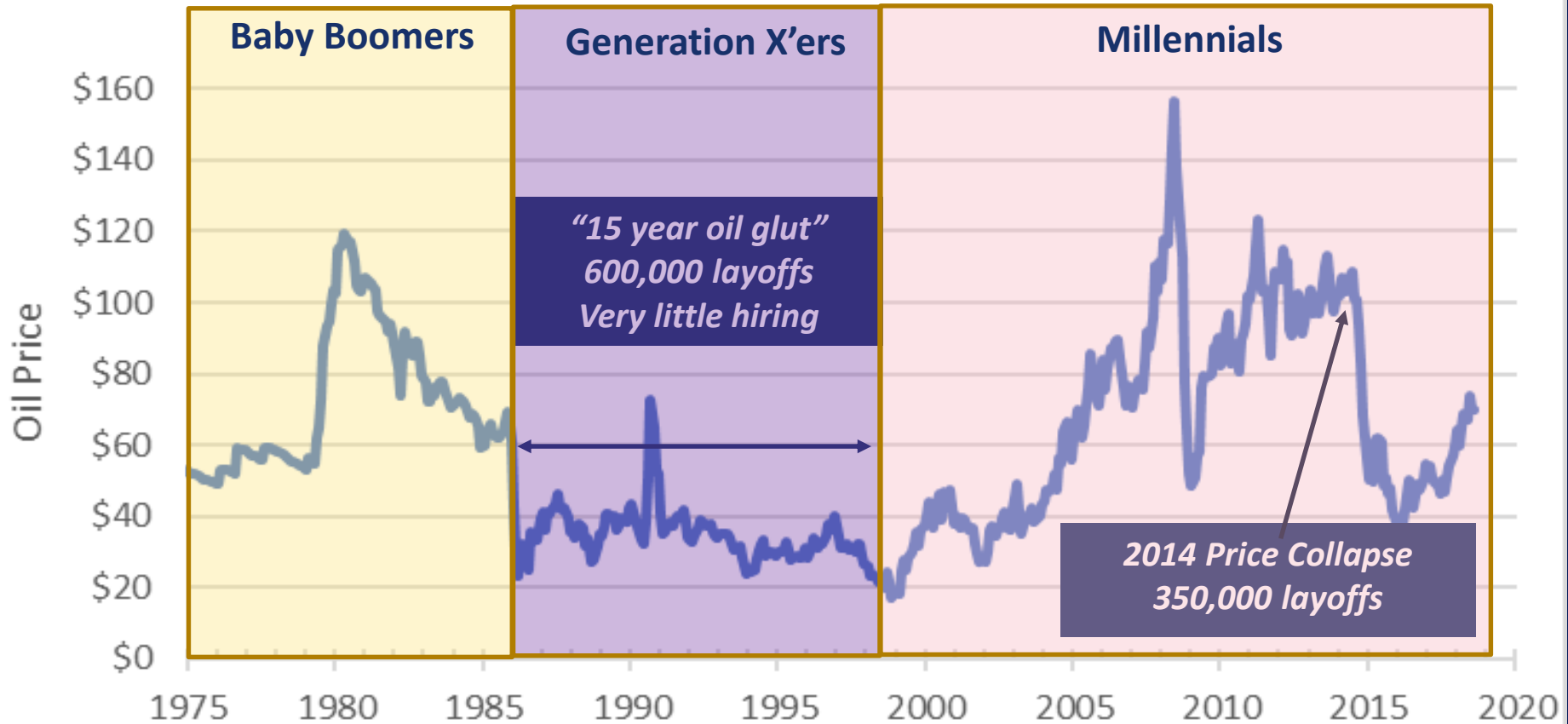
I. Defining the Need for Talent Development

II. Training Options

- Internally Focused Development Programs
- External Resources

III. How Can You Help?

Overcoming Workforce Gaps

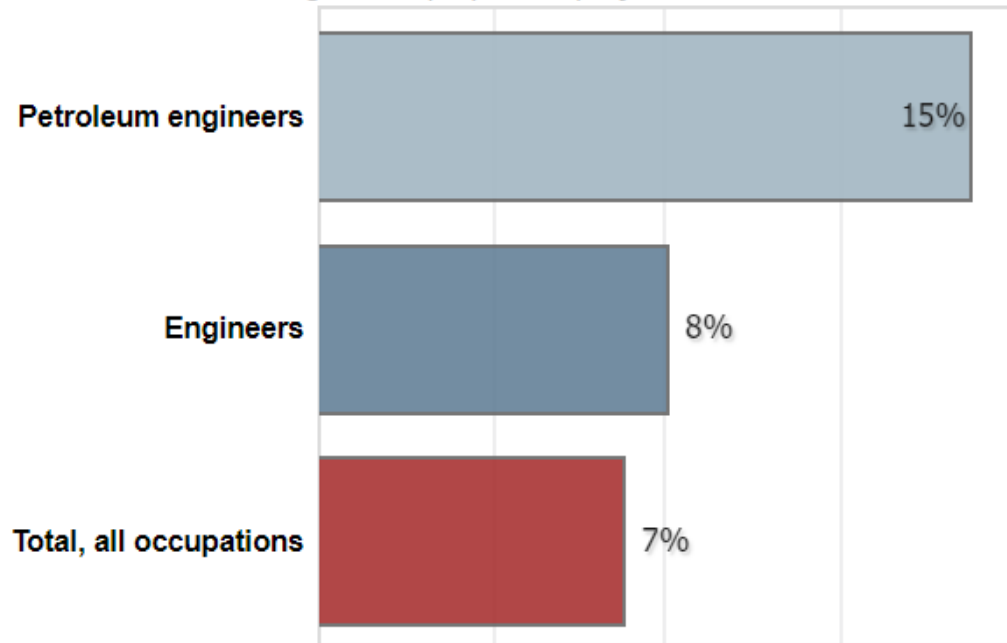


A Growing Demand for Petroleum Engineers



Petroleum Engineers

Percent change in employment, projected 2016-26



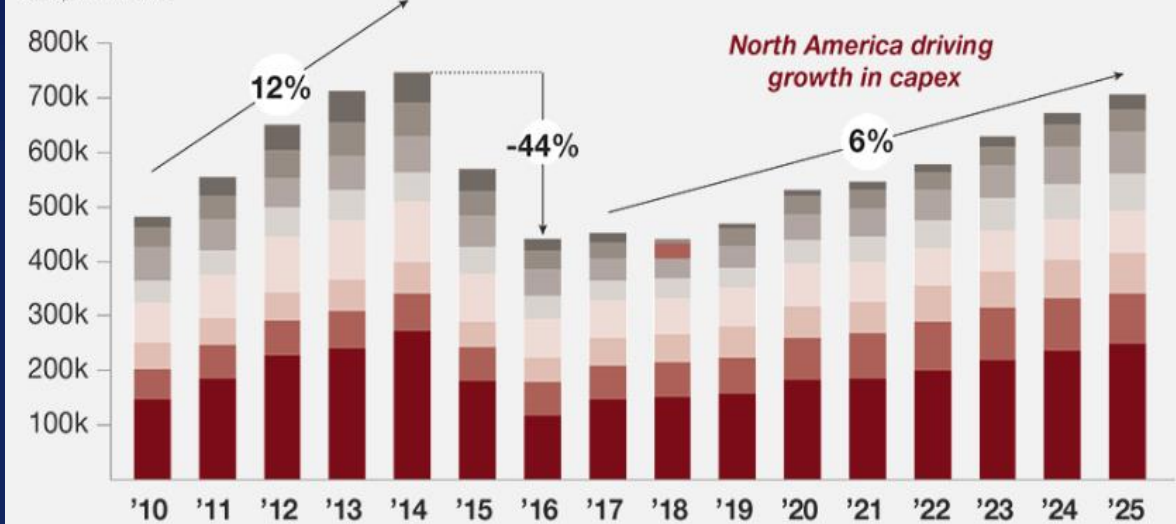
Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Employment Projections program

Expanding investments in oil and gas exploration

Global oil and gas capital expenditures

US\$ millions



Source: Rystad Energy; Strategy& research

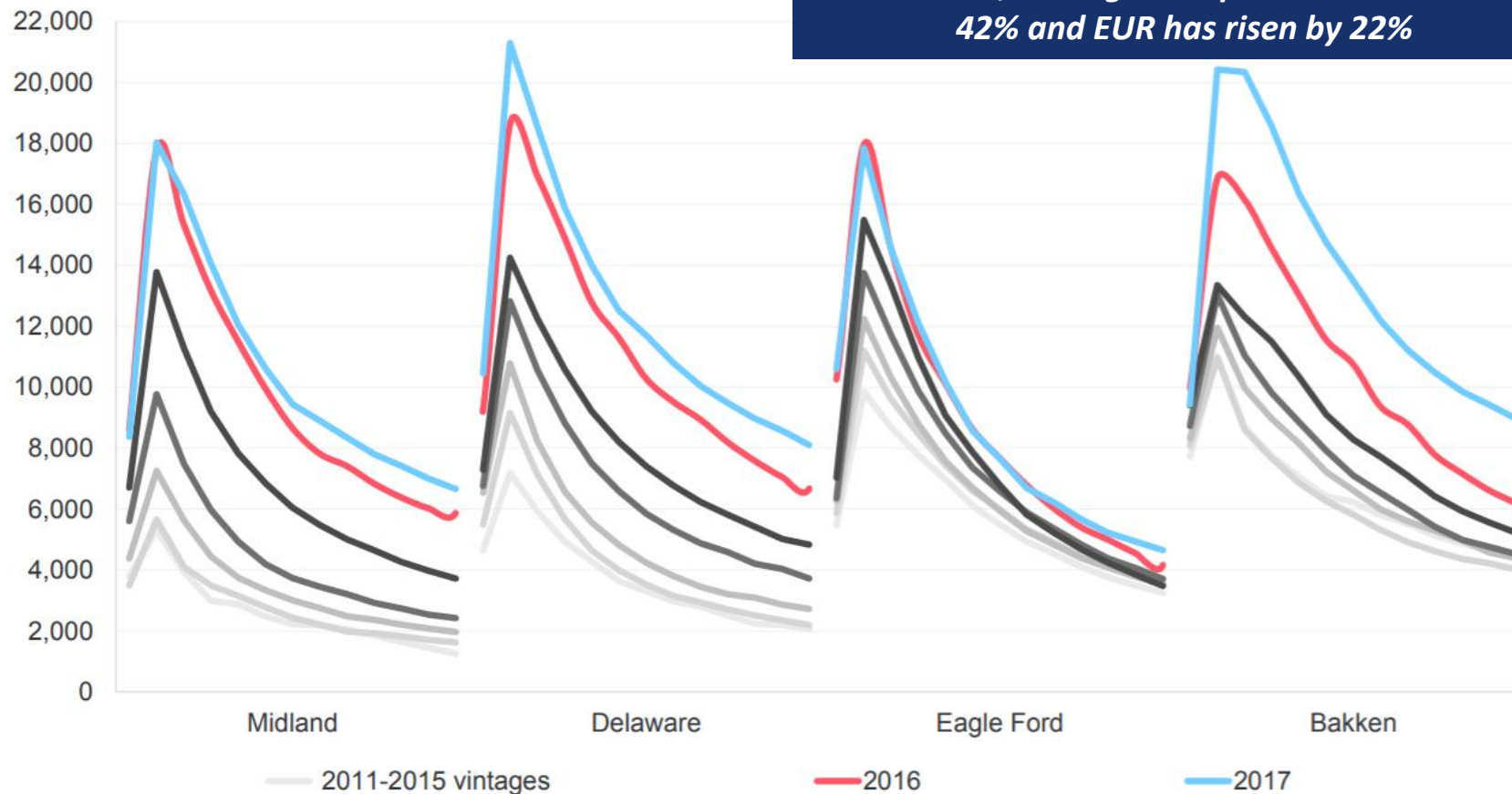


Defining the Need

We Are Still Learning

First year oil decline curves for horizontal wells by production start year (median)

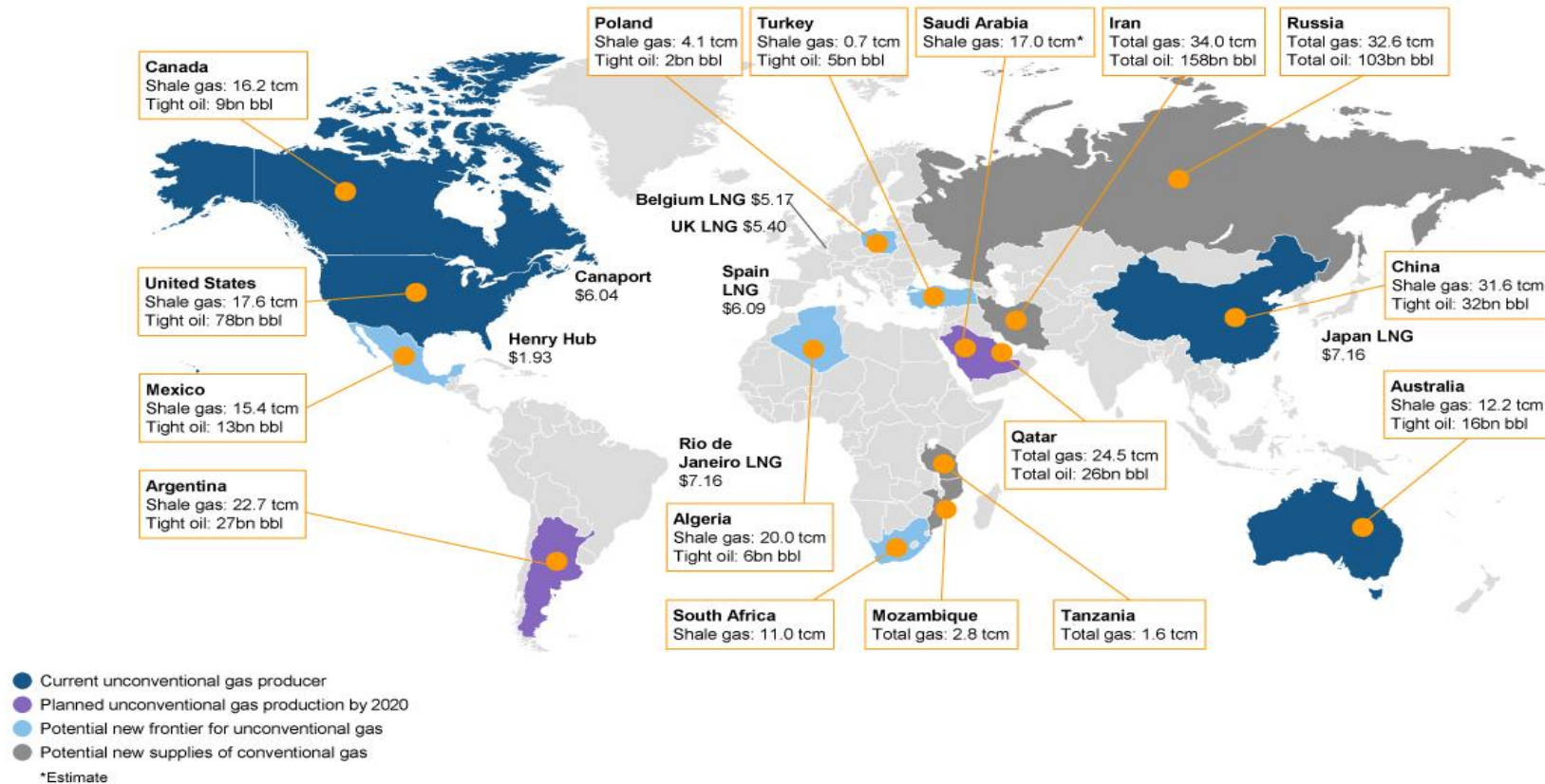
Barrels of oil per month



Source: Rystad Energy NASWellCube (February 2018)

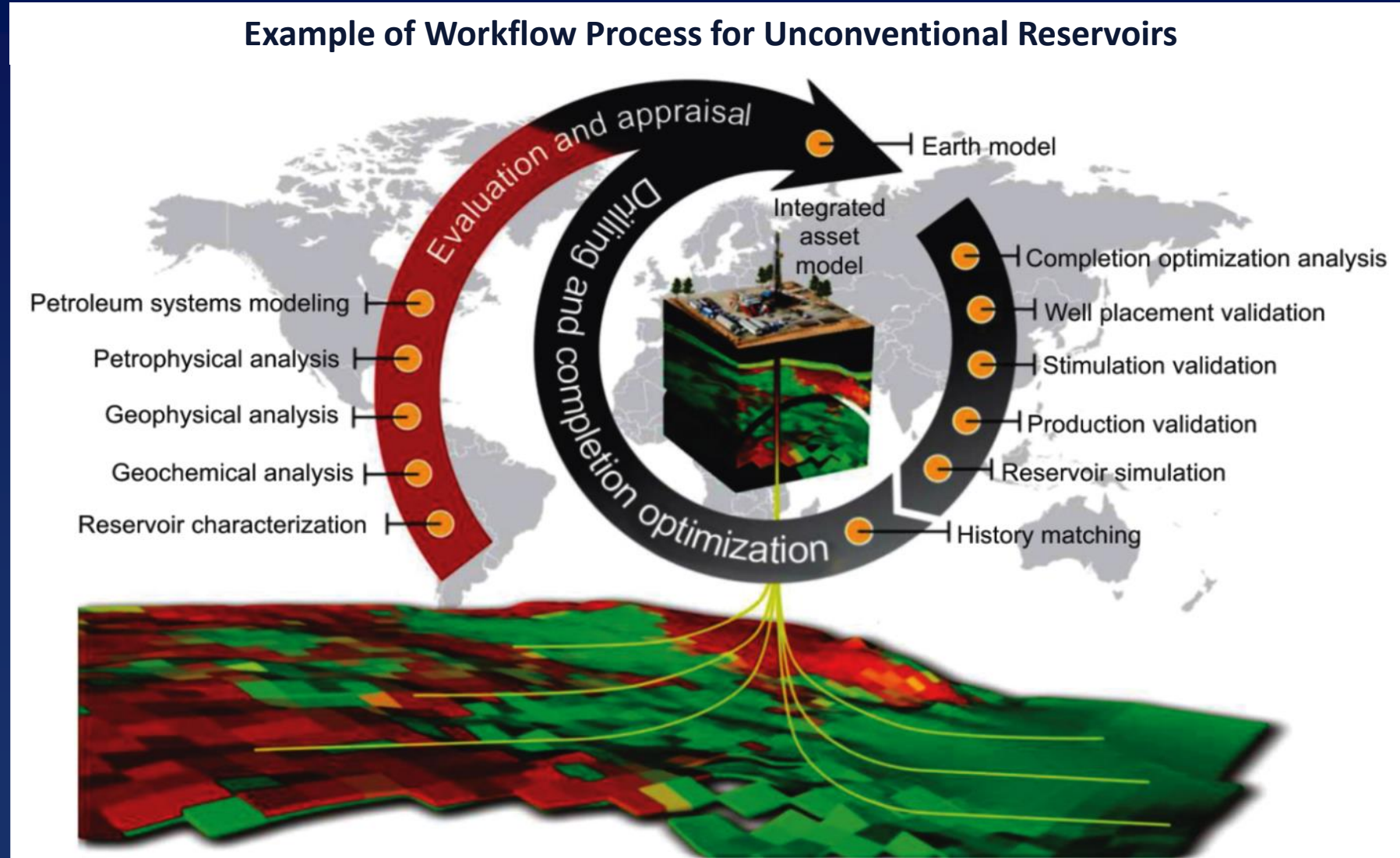
Global Expansion of Unconventionals

Unconventional gas, a global phenomenon



*Source: BP Statistical Review of World Energy, EIA, FERC, and Reuters (2016)

The Importance of Multidisciplinary Knowledge



Training Options

Internally Focused Engineering Training

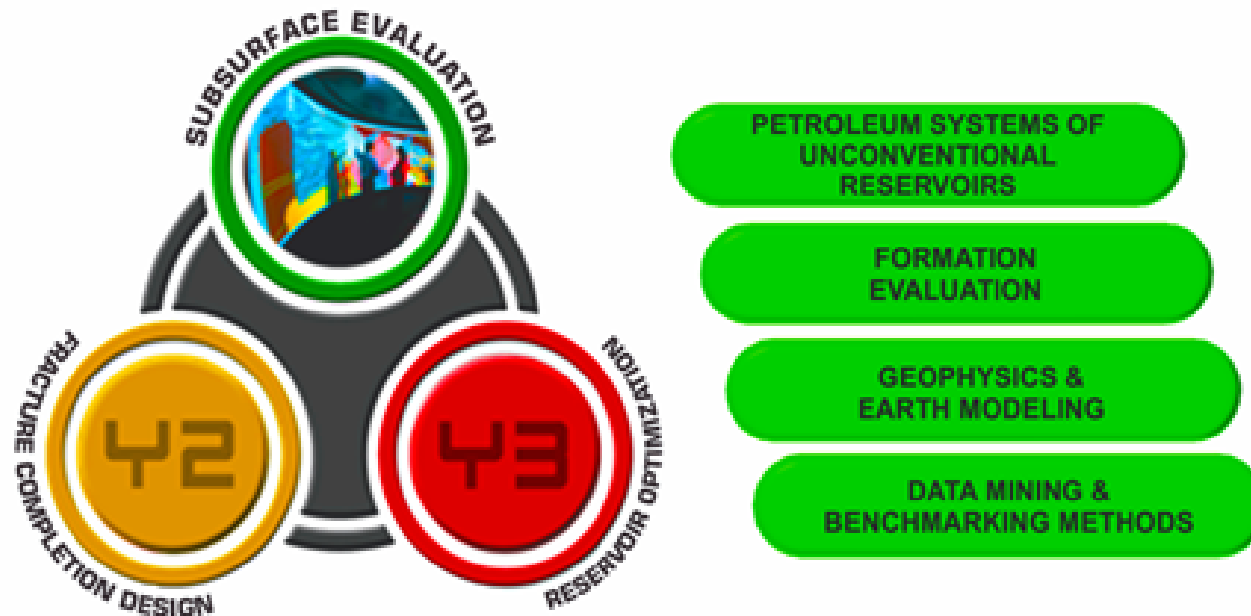
“College of Completions Engineering” – A Case Study

Guiding Principles

- Advanced level training – minimum 2 years with company
- 10 total courses, one course per quarter
- Multidisciplinary curriculum
- Use in-house subject matter experts when possible

Curriculum – In-House Training Program

Subsurface Evaluation – YEAR 1



Topics

- Depositional environments
- Petroleum systems
- Source rock maturation
- Geomechanics
- Log analysis
- Formation evaluation
- Geophysical measurements
- Earth modeling
- Data mining

Curriculum – In-House Training Program

Completion Design – YEAR 2

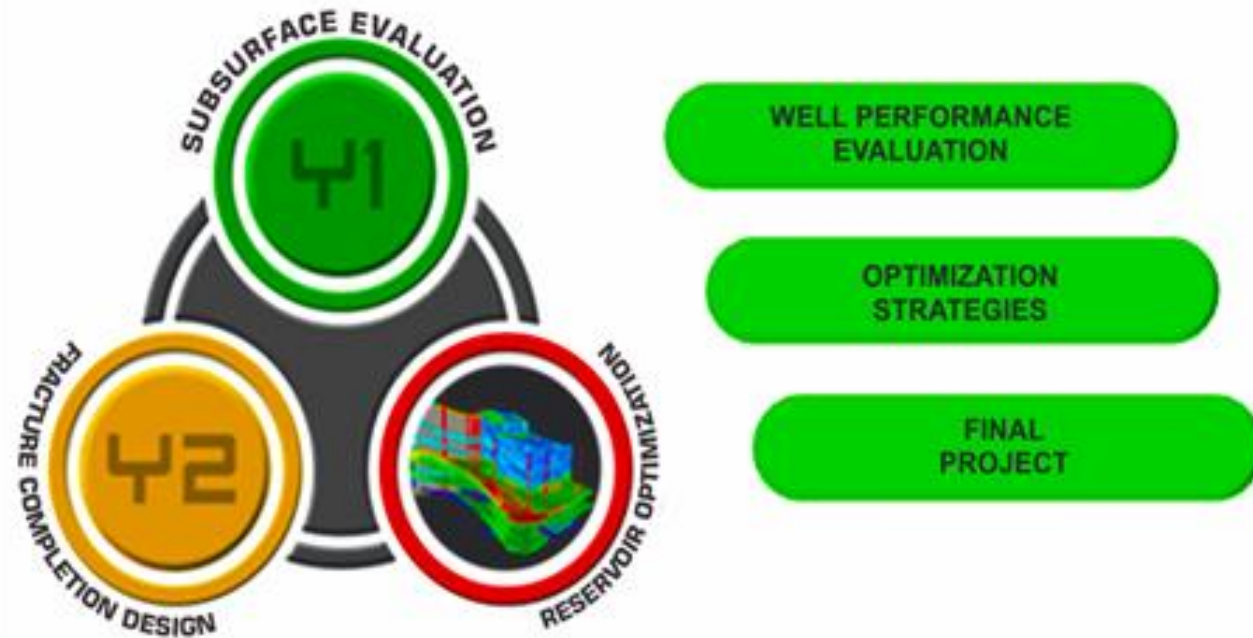


Topics

- Horizontal well completions
- Artificial lift
- Perforating strategies
- Fracture modeling
- Diagnostic methods
- Collaborative projects
- Reservoir simulation

Curriculum – In-House Training Program

Reservoir Optimization – YEAR 3



Topics

- Well performance evaluation
- Refracturing techniques
- Field assessment and well planning
- Optimization strategies
- Final project

Observations from the Training Program

- Program received well by students and management
- Demand was very high
- Low attrition rates
- Many career advancements
- Opportunities for mentoring

Industry Training Resources

Industry Resources – Society of Petroleum Engineers



“SPE’s mission is to provide opportunities for professionals to enhance their technical and professional competence.”

Available Resources

- ❑ Competency Management Tool
- ❑ Classroom Training Courses
- ❑ Conferences and Workshops
- ❑ Knowledge Databases (OnePetro, PetroWiki, etc)
- ❑ Online Webinars and Training Modules

SPE - Classroom Training Courses



 SPE TRAINING COURSES AND SEMINARS

Complete Course and Seminar Catalog

Instant search

COURSE ▲	DISCIPLINE ⇅	INSTRUCTOR ⇅
A Systematic Approach to Water Management in Unconventional Reservoirs While Doing Surface Field Development Planning		Lorenzo Hernandez P. Eng.
Addressing New Opportunities in Mature Oil and Gas Fields		Arshad Khan
Advanced Coiled Tubing Engineering and Best Practices		Todd Green
Advances in Formation Testing		Hani Elshahawi
An Overview of Enhanced Heavy Oil Recovery		Behrooz Fattahi
An Overview of Microseismic Imaging of Hydraulic Fracturing		Kenneth D. Mahrer

SPE – Conferences and Workshops



Membership Events Publications Training Resources

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- Russia and Caspian
- Sub-Saharan Africa
- United States

SPE Global Events

Mobile

 Showing 1 to 25 of 51 events (filtered from 80 total events)

DATE	TITLE	TYPE	STATUS	LOCATION
13 - 14 Sep 2017	SPE Liquids-Rich Basins Conference - North America 	Conference		Midland, Texas, USA
19 - 21 Sep 2017	SPE Workshop: Horizontal, Multilateral and ERD Wells Drilling and Completion 	Workshop		Moscow, Russia
25 - 26 Sep 2017	SPE/EAGE Workshop: Geohazards 	Workshop		Kuala Lumpur, Malaysia
26 - 27 Sep 2017	SPE Workshop: Production Forecasting for Heavy Oil and Unconventional Resources 	Workshop		Calgary, Alberta, Canada
4 - 6 Oct 2017	Eastern Regional Meeting 	Symposium		Lexington, Kentucky, USA
9 - 11 Oct 2017	SPE Annual Technical Conference and Exhibition 	Conference		San Antonio, Texas, USA
15 - 18 Oct 2017	SPE Kuwait Oil & Gas Show and Conference 	Conference		Kuwait City, Kuwait

SPE – Online Education



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On-Demand Products

How to Present like an Award Winning Actor Contains 2 Component(s), 0.15 CEU earned

Recorded On: 08/22/2017 [Re-send Receipt](#) ★ Completed [Hide](#)

This course goes far beyond learning to create inspiring speeches. It will give participants the tools to create a powerful presence so that they can have more influence on their projects and work environments.

Reservoir and Completion Considerations for the Refracturing of Horizontal Wells (Based on SPE-184837-MS) Contains 2 Component(s), 0.15 CEU earned Recorded On: 06/14/2017 [Re-send Receipt](#) [Hide](#)

★ Completed Completions

Horizontal well developments, focused on transverse hydraulic fracture stimulation, have evolved rapidly over the past decade. Many of these completions may have missed or bypassed significant reserves that were intended to be produced from the well. This webinar, based on an SPE paper discusses the potential reasons for

Self-Paced Training Program using SPE Resources



Topic	SPE Online Courses	Duration (hrs)	Cost
Petroleum Systems	<i>Introduction to Unconventional Resources</i>	4.5	\$115
Formation Evaluation	<i>Petrophysical Evaluation</i>	8	\$190
Geophysics and Earth Modeling	<i>Reservoir Geophysics</i>	8	\$190
Data Mining and Benchmarking Methods	<i>Interdisciplinary Data Acquisition</i>	8	\$190
Well Completion Strategies	<i>Basic Completion Design and Practices</i>	2	\$115
Frac Design	<i>Hydraulic Fracturing</i>	7	\$115
Reservoir Engineering for Unconventionals	<i>Reservoir Simulation</i>	8	\$190
Well Performance Evaluation	<i>Flowing Well Performance and Production System Analysis</i>	8	\$190
Optimization Strategies	<i>Economic Evaluation</i>	8	\$190
	Advanced Training Program	61.5	\$1,485

Self-Paced Training Program using SPE Resources



Topic	SPE Online Courses	Duration (hrs)	Cost
Petroleum Systems	<i>Petroleum Geology and the Exploration Process</i>	2	\$115
Formation Evaluation	<i>Formation Evaluation Overview</i>	2	\$115
Geophysics and Earth Modeling	<i>4D Seismic Monitoring for Assessing Reservoir Heterogeneity and Its Impact on Hydraulic Fracture Stimulation</i>	1.5	free
Data Mining and Benchmarking Methods	<i>Smart Proxy Modeling for Numerical Reservoir Simulations – Big Data Analytics in E&P</i>	1.5	free
Well Completion Strategies	<i>Unconventional Completions - A Paradigm Shift - Evening Session</i>	1	free
Frac Design	<i>Hydraulic Fracturing Topics</i>	6.5	free
Reservoir Engineering for Unconventionals	<i>Fundamentals of Reservoir Engineering</i>	1	\$115
Well Performance Evaluation	<i>Reservoir Modeling and Reserves Evaluation</i>	3	\$115
Optimization Strategies	<i>Production Optimization for Unconventional Reservoirs through Multi-Disciplinary Collaboration</i>	1.5	free
	Condensed Program	20	\$460

Third Party Training



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Geophysics
Petrophysics
Reservoir Engineering
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Courses - Petroleum / Reservoir Engineering

Title	Length		
Petroleum Engineering for Non-Engineers (4 Day)	4 days	More Details	Register Now
Petroleum Engineering for Non-Engineers (2 Day)	2 days	More Details	Register Now
Fundamentals of Reservoir Engineering	5 days	More Details	Register Now
Reservoir Engineering for Non-Reservoir Engineers	4 days	More Details	Register Now

How Can You Help?

Volunteer and Engage

- ❑ University presentations
- ❑ Local SPE chapters and functions
- ❑ Young Professional (YP) groups
- ❑ Mentoring opportunities
- ❑ SPE meetings and workshops (chairing sessions, program committee, etc)

Expand your Knowledge

- ❑ Use all the resources
- ❑ Broaden your skill set
- ❑ Seek out mentors
- ❑ Publish and present
- ❑ Consider a Professional Engineering (PE) License

Summary



- ❑ Our industry faces several challenges regarding the development of our young engineers
- ❑ Both internal and external training options can be used for engineering development
- ❑ Companies that focus on advanced training will be rewarded with a more competent and inspired workforce

Thank you!

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