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# **The 2<sup>nd</sup> International IEF Symposium on Human Resource Management in the Energy Industry: Implications of a New Market Environment and Energy Transition**

## **Background Materials**

17-18 May 2017 | Manama, Bahrain



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# Concluding remarks from IEF Symposium 2009 (I)

## Root causes and nature of problems facing the industry



### Recruitment and retention

- Recruitment and retention of key personnel highly qualified and experienced has been a contributory factor to cost escalation in the oil and gas industry since 2005

### HR demographics

- With the average age of professionals in the oil industry at ~50, it is likely that 50% of the industry's current skilled workforce will be lost to natural attrition through retirement within the next ten years

### Cross industry competition

- Competition from other high-tech industries and environmental concerns have combined with cutbacks in technical and earth science programs in universities, leading to an ageing workforce and a scramble for talent

### Job vulnerability

- Job security is a major concern among students and the industry's reputation for vulnerability to "boom and bust" cycles presents a major obstacle to recruitment

### Perceived prospects of the industry

- The commonly held negative perceptions of the oil and gas industry, along with its long-term prospects, don't contribute to attract talent from the pool of resources available

# Concluding remarks from IEF Symposium 2009 (II)

## Industry response and potential long-term solutions



### Ample awareness

- Growing understanding within the industry of the need to establish long-term recruitment and retention policies in order to regain trust and build the foundations necessary to support future requirements

### Sharing best practices

- Simple proactive measures already practiced by many in the industry hold great potential if applied more widely across the sector.
  - Some examples are wider provision of Scholarships, sponsoring of academic chairs in the essential Earth Sciences and support for internship schemes

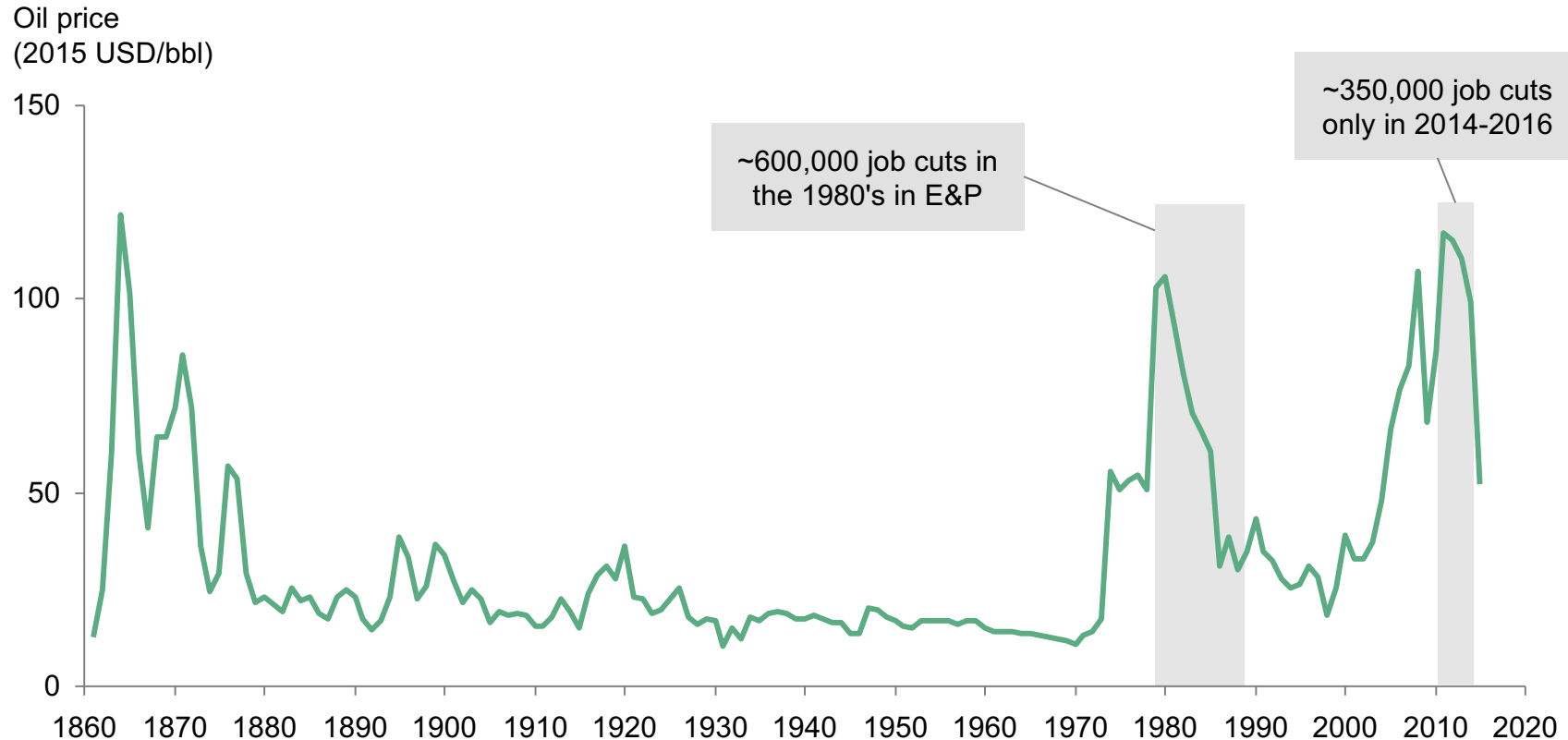
### Proactive management of cyclicity

- Companies must resist short-term economic pressures to implement cuts in workforce under bust cycles. Establish training budgets as a fixed percentage of earnings would be interpreted by new recruits as a message of long-term commitment

### Cooperation amongst stakeholders

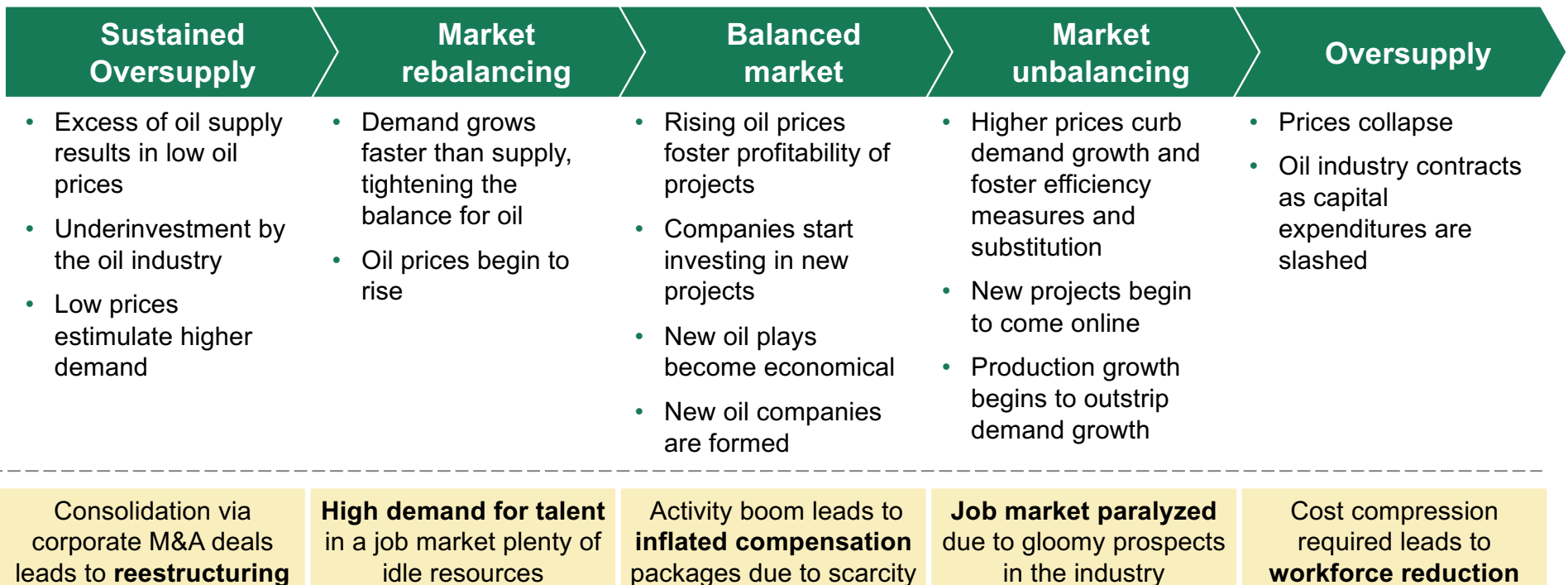
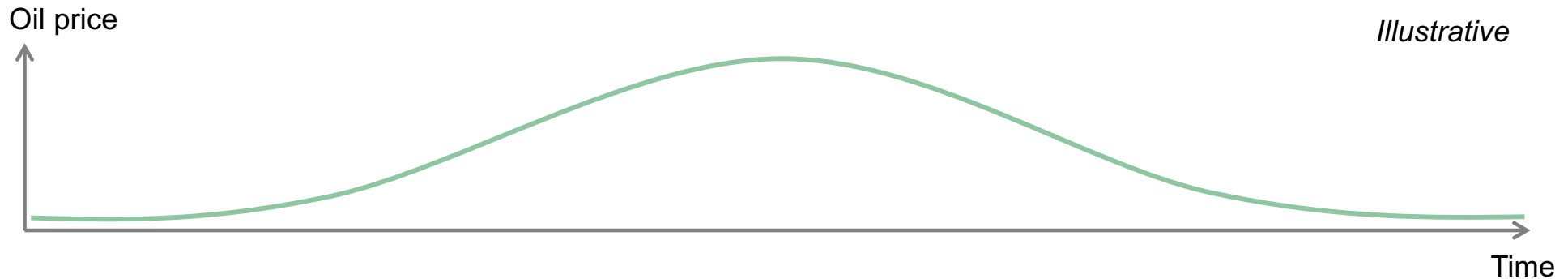
- Industry, government and academia stressed that de-bottlenecking the sector's human resource challenges requires collective, targeted and innovative cooperation between government, educational institutions and industry

# The history of the energy industry has been one of cycles



**Unpredictability of oil price cycles impact negatively the workforce management in the oil and gas industry**

# Boom and bust cycle in the oil industry is a function of the capital intensity of the business



Impact in HR

# Energy companies are facing now severe business struggles

In response to low prices environment, new entrants, and consensus on the need for an energy transition...



Oil prices are lower for longer, impacting notably the liquidity of the sector



Aggressive competition from smaller players, in particular for Unconventionals



Need to reduce costs and tweak the supply chain to make assets profitable



Increasing difficulty to obtain social "license to operate"



Regulation and political decisions are very unstable and unpredictable



Shale dynamics are causing disruption in traditional business models

... the industry has been forced to reduce costs, increase efficiency and explore new business models

# Uncertainties in this new environment create new challenges and opportunities in human resource management

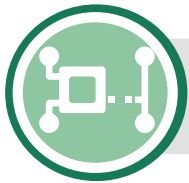
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**Generational Gap**



**Expertise management**



**Digital mindset irruption**



**Industry attractiveness**



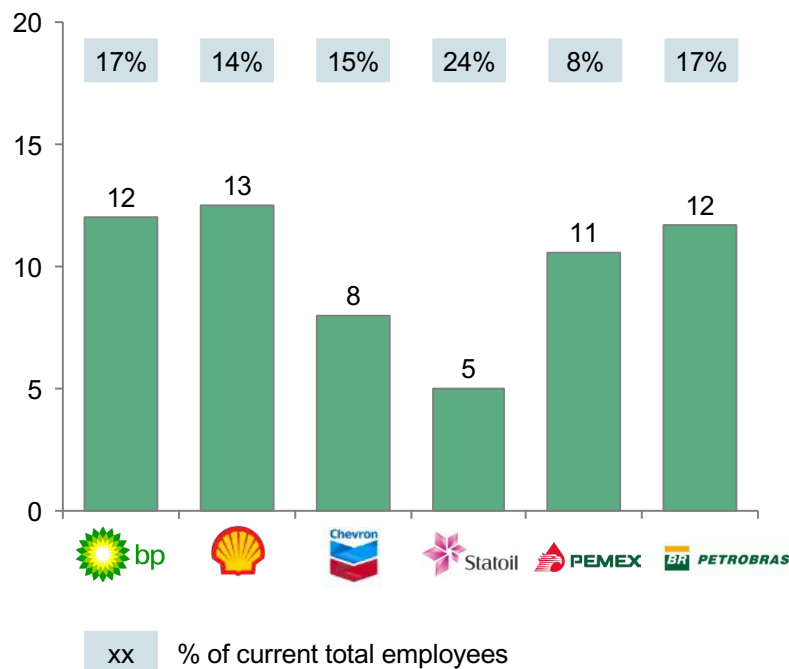
**Gender diversity**



# 1. Oil & Gas industry is experiencing a big loss of resources

## Large O&G players have recently announced important layoffs...

Announced layoffs since 2015 ('000 employees)



## ... and the industry is acknowledging globally such downturn

"Worldwide job losses in the O&G industry have just topped 350,000. (...). The impact of layoffs has been most severe in the oilfield service sector of the industry, with 152,015 layoffs, or over 43% of the total worldwide."

*Oil and gas financial journal, May 6th, 2016*

"More than 140 North American oil and gas producers and service companies have filed for bankruptcy since the beginning of 2015 (...). Those that survived did so by cutting costs, including laying off more than 350,000 workers globally and cutting back on new drilling"

*Bloomberg, June 8th, 2016*

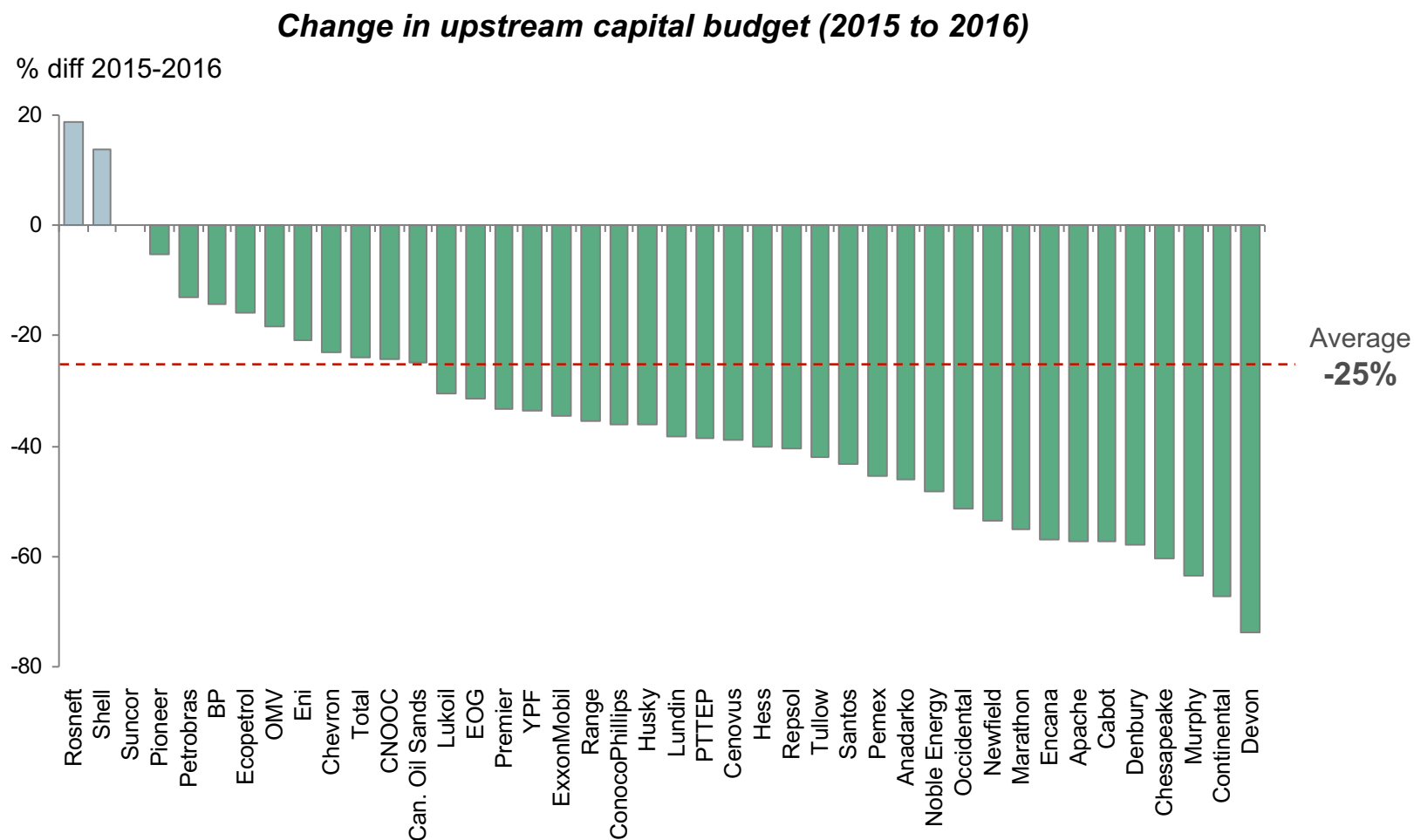
"The number of jobs lost as a result of the downturn in the UK oil and gas sector could top 120,000 by the end of this year. Oil & Gas UK estimated 84,000 jobs linked to the industry went in 2015, with 40,000 losses expected this year"

*BBC News, June 10th, 2016*

**Senior employees in (pre)retirement ages are strong candidates to help meet layoff plans**

# Large capex cuts show serious hangover for oil

Operators cut an average of 25% on 2016 capex budget



Note: Shell's capex increase reflects the addition of BG.  
Source: Company reports, JP Morgan, BCG Analysis

# Changes in labor market can have substantial impact in the business

## Issues affecting O&G labor market

- 1 'Crew change' resulting in younger workforce



- 2 High voluntary attrition



- 3 Skills shortage



- 4 Dwindling graduate pool



- 5 Push for use of local labor



## Potential impact

Increased  
cost



Project  
delays

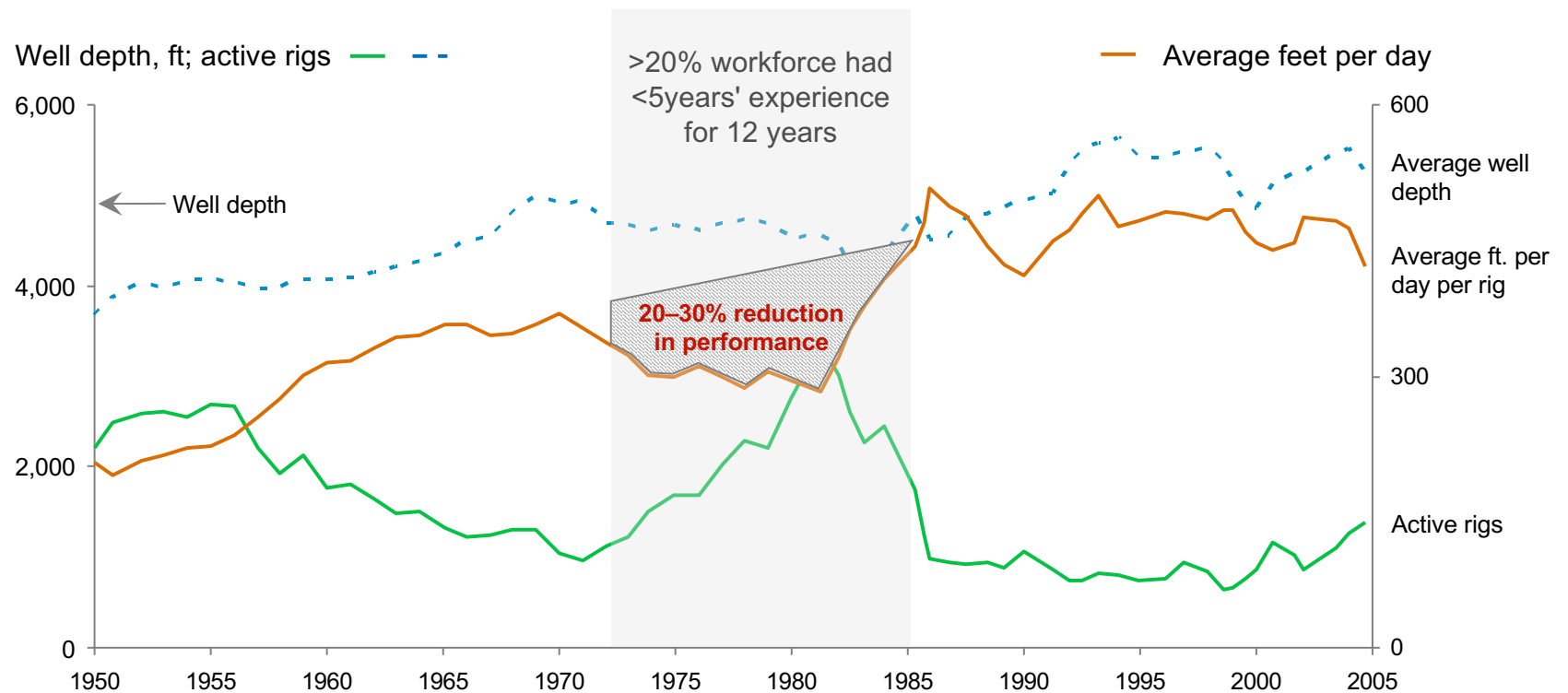


Reduced  
Safety



# Have we learnt from the past?

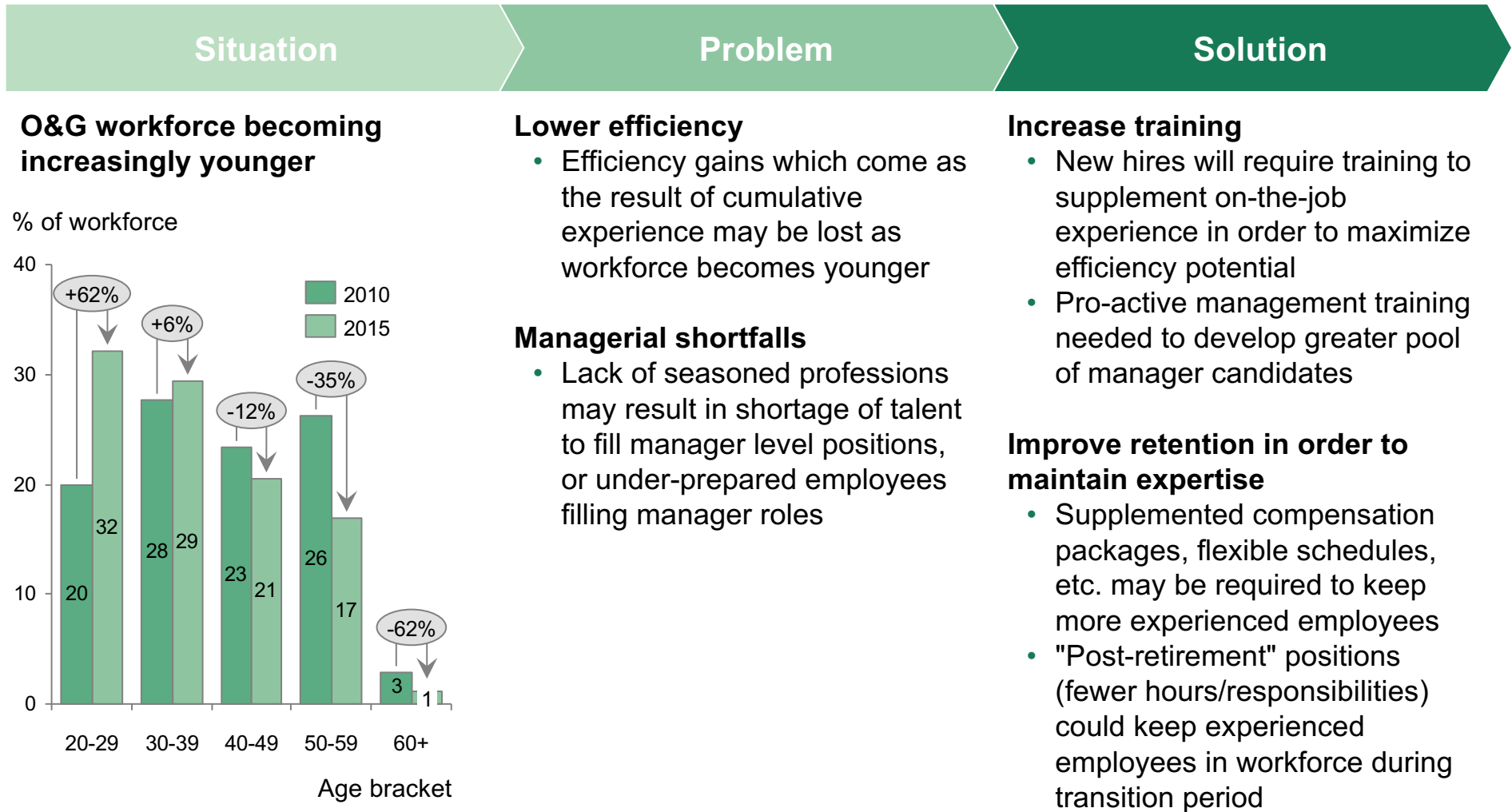
## Average drilling performance in the US



Source: Society of Petroleum Engineers: Lessons From History—The Value of Competent People; BHI Rig count, IPAA

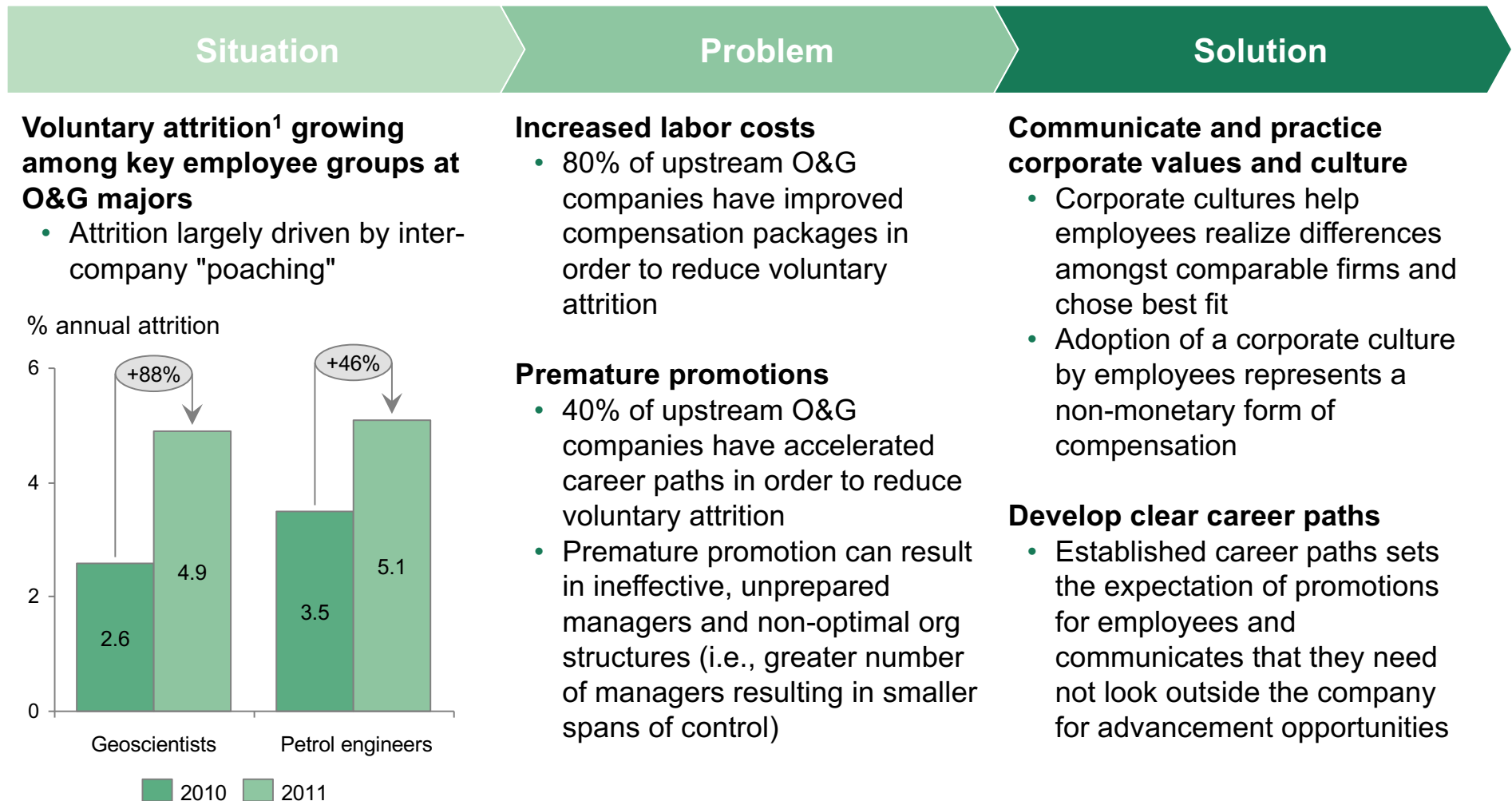
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# Experience drought from workforce getting younger require investment in Training & Retention



Source: BCG analysis, SBC O&G HR Benchmark 2011

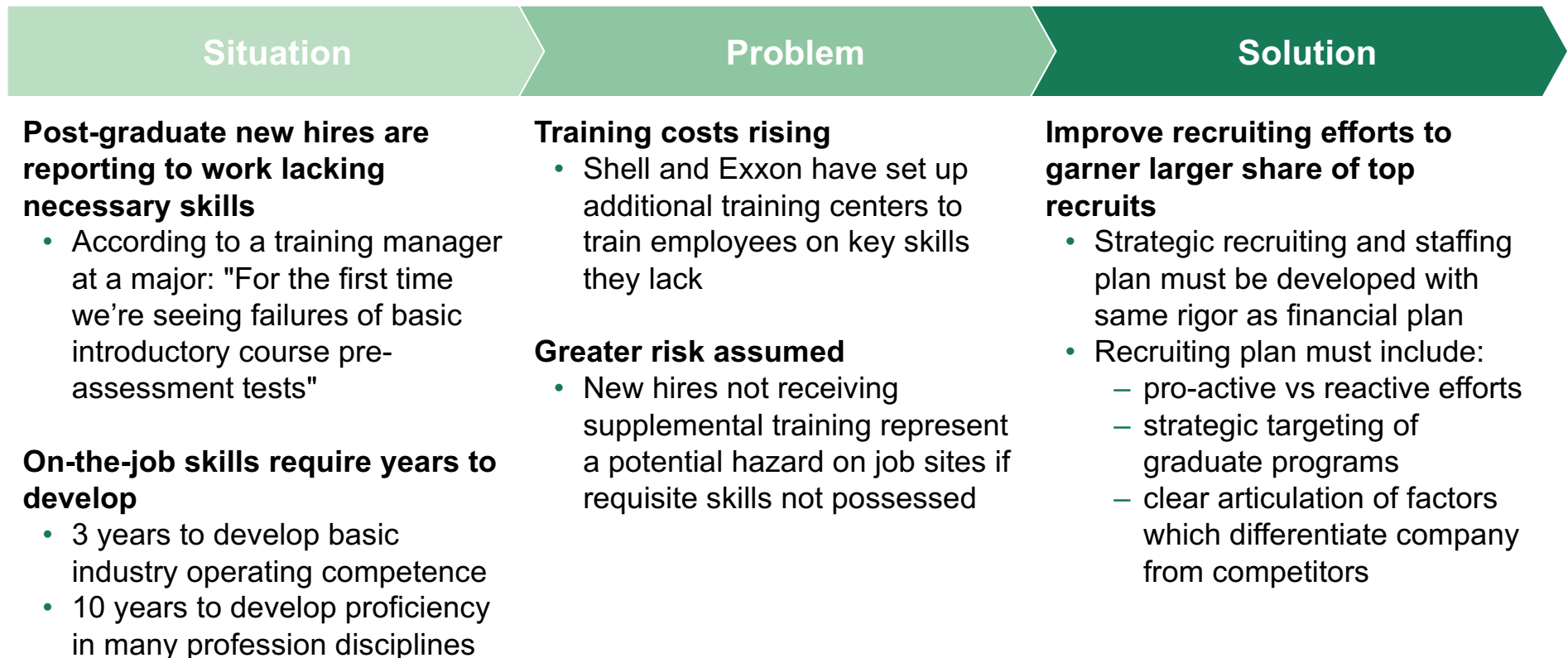
# Development of Career Paths and strong culture could be used to combat voluntary attrition



1. Excludes retirements

Source: BCG analysis, SBC O&G HR Benchmark 2011, 2009-2012 Triennium Work Report

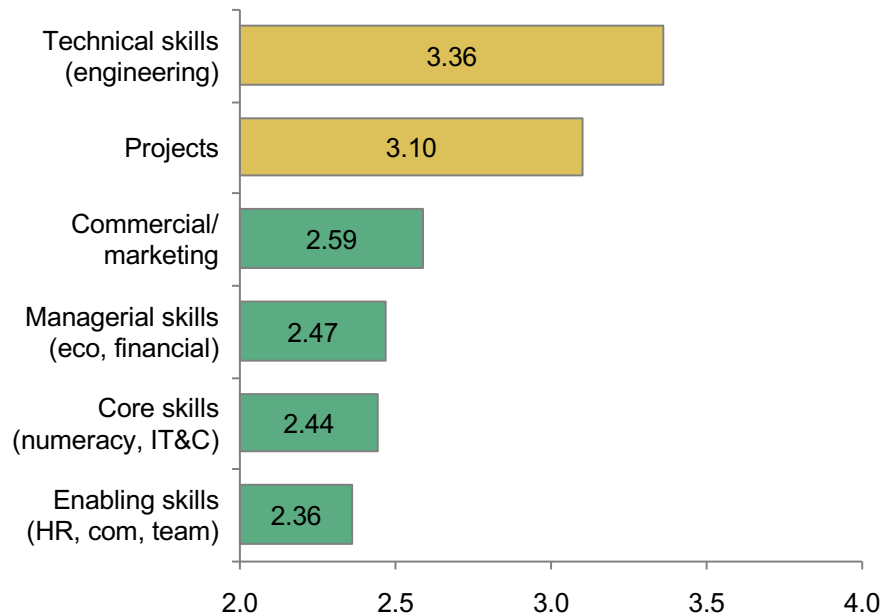
# Proactive and targeted Recruitment required to capture high-potential candidates with robust skill sets



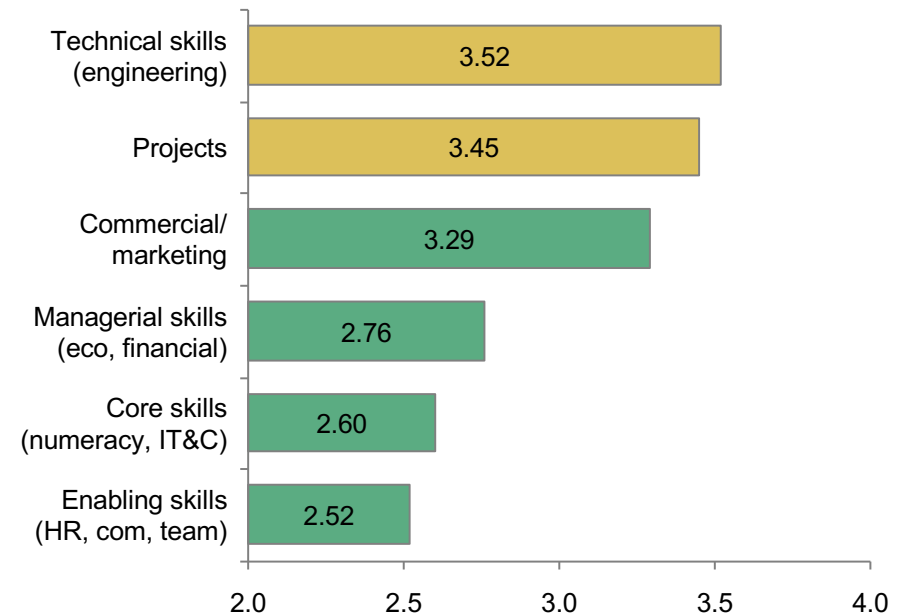
## 2. Technical and Project skills seen as having the greatest shortage for both IOCs and NOCs

Expertise  
management

### International Oil Companies



### National Oil Companies



Scale: 0 = no shortage; 5 = highest shortage

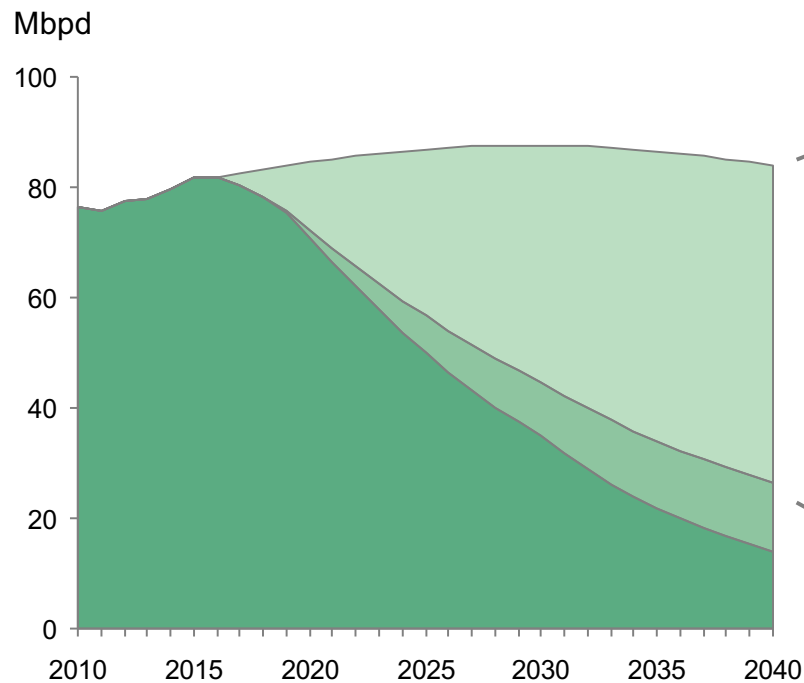


# The world will continue to need substantial oil investments...

Therefore new human capabilities will be required

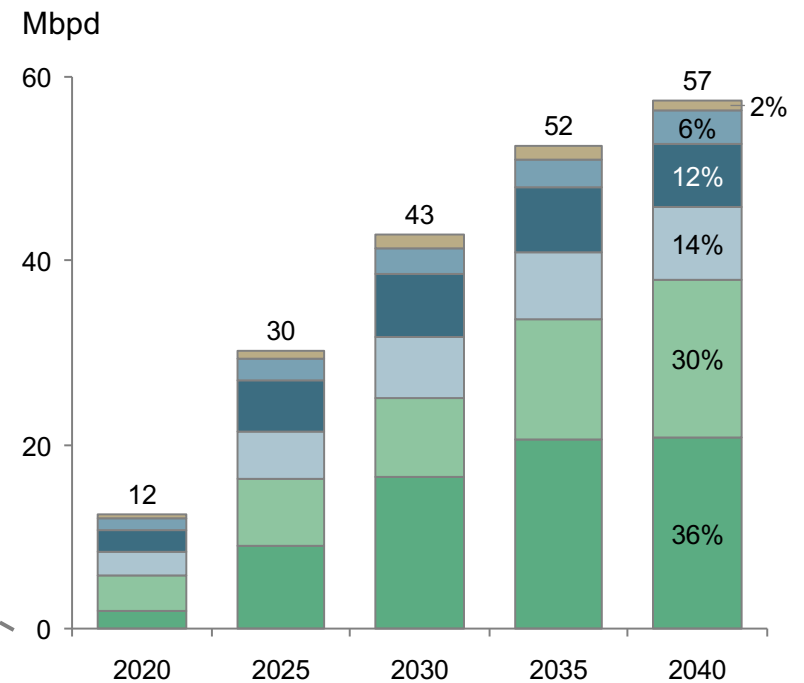
*Illustrative*

**Oil production forecast**  
-under most pessimistic scenario-



■ New production  
■ Already producing @ 85 price scenario  
■ Already producing @ 50 price scenario

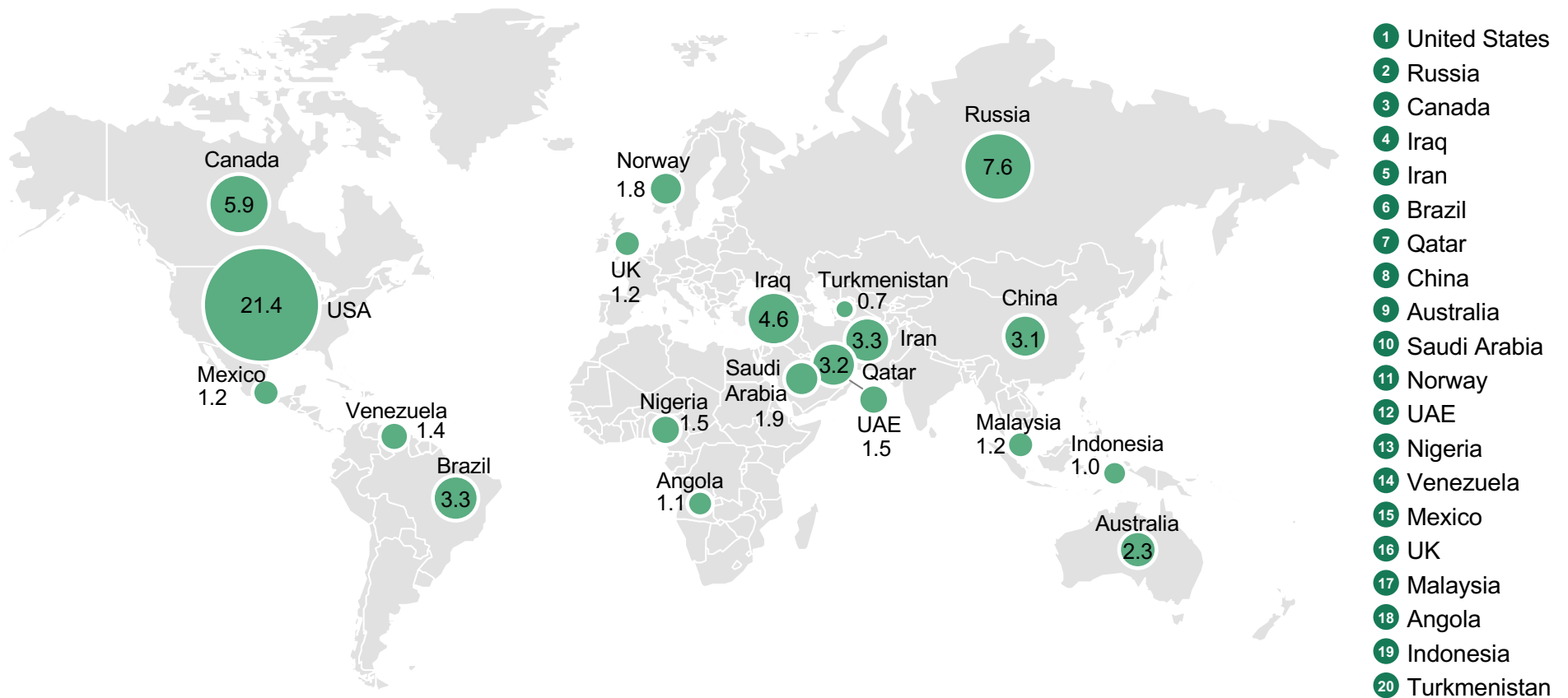
**New production volumes**  
-by type of play-



■ Oil sands  
■ Offshore midwater  
■ Offshore deepwater  
■ Offshore shelf  
■ Shale/Tight oil  
■ Other Onshore

# Where will we need people?

*Expected production of oil & gas from new fields in 2020 (Mboe/day) – Top 20 countries*



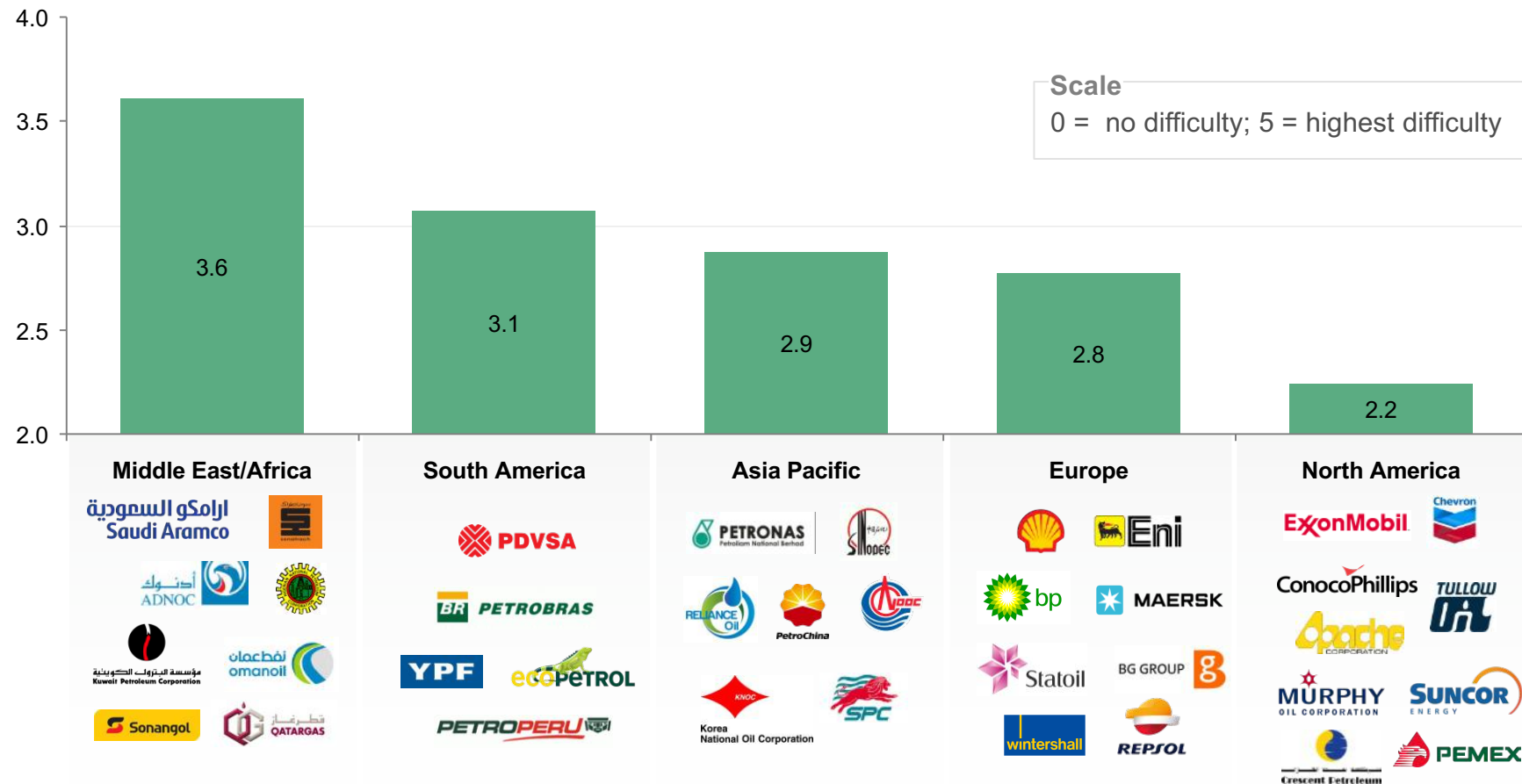
Source: Rystad UCube, Field types: Producing early, Under development, Field evaluation, Appraising, Old discoveries, Undiscovered awarded for oil and gas production

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# Technical recruiting remains still challenging

Middle East/Africa seen as the most difficult regions for recruiting

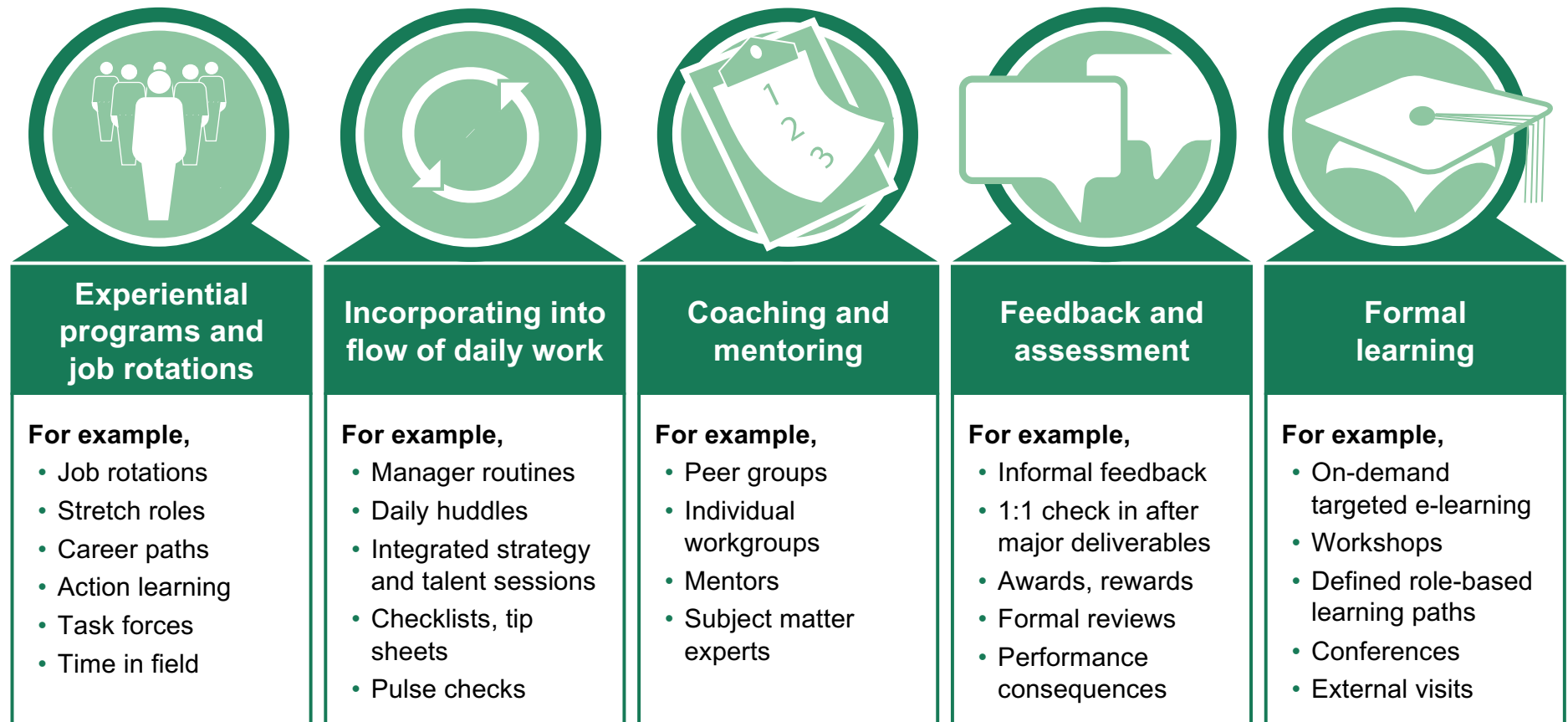
*Difficulty to recruit by region*



Source: BCG analysis, 2009-2012 Triennium Work Report

# Technical capability building requires integrated approach

Embedded in day-to-day work; co-designed by leaders and stakeholders



# Proactive identification of capacity risks is needed by skill cluster

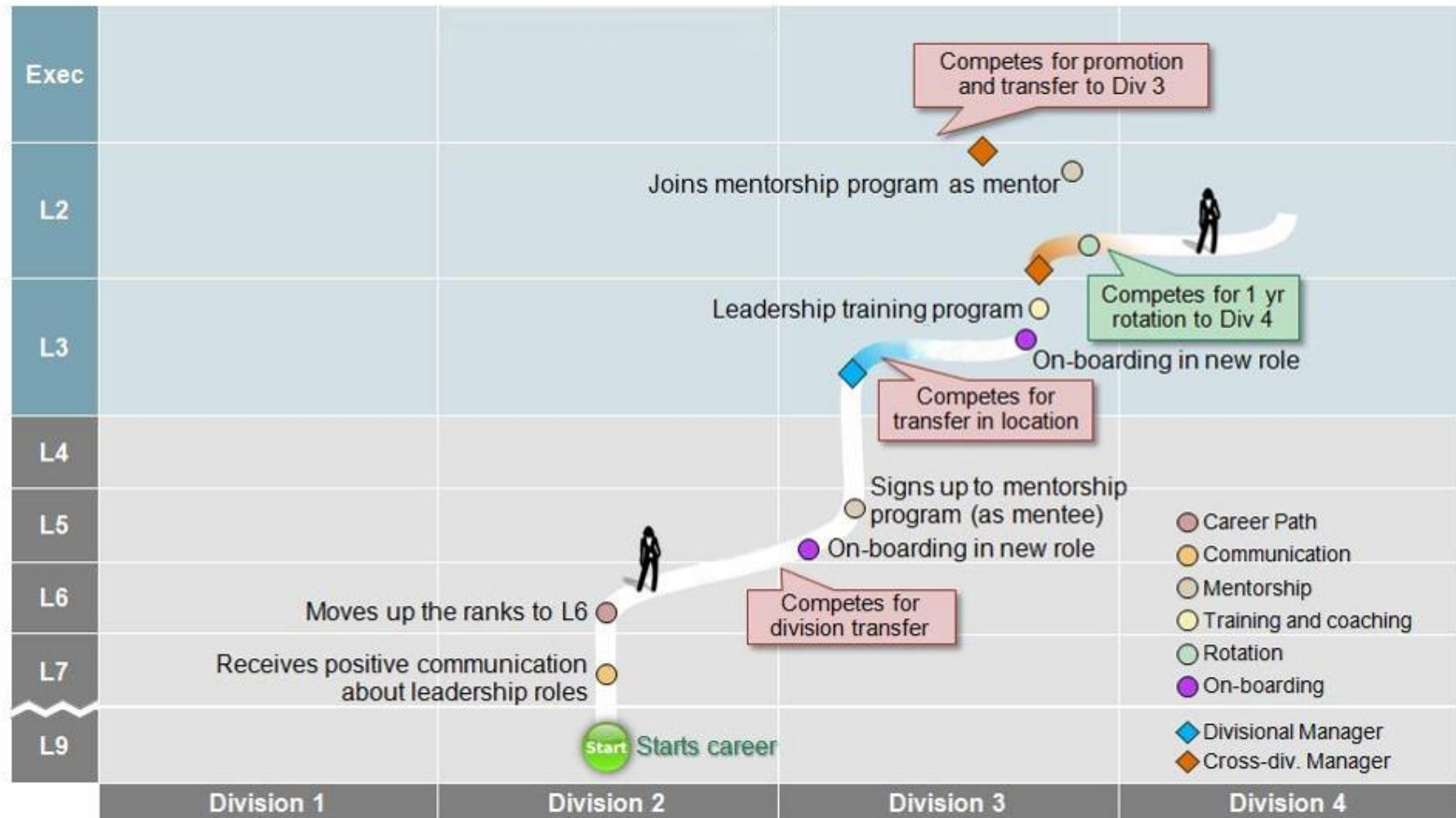
## Illustrative example for Power sector

Skill cluster	WF 14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
High voltage electricians	242	37	32	-31	-61	-76	-79	-74	-120	-122	-135
Maintenance specialist	327	34	45	41	-59	-65	-92	-96	-101	-114	-112
Maintenance generalist	397	58	53	59	46	-112	-156	-166	-162	-150	-152
General electricians	799	104	101	80	-237	-202	-159	-114	-100	-100	-100
Plant operator	96	0	23	20	0	-24	-28	-32	-36	-28	-35
Metalworking mach. op.	190	16	9	0	3	8	13	16	18	18	18
Safety supervisor	96	-23	-24	-27	-13	-23	-23	-45	-47	-42	-45
Technical workers	853	118	120	121	63	41	20	6	5	3	2
Production IT expert	52	-17	-18	-18	-19	27	-28	-28	-29	-29	-29
Equipment maintenance	265	-46	-73	-95	-73	-54	-41	-11	-11	-4	-3
Specialized molder	211	119	110	86	-271	-179	-77	-15	-16	-8	-66
Electrical system maint.	95	-27	-25	-23	-39	-45	-47	-48	-53	-53	-53
Electrical engineer	188	-18	-66	-85	-90	-91	-103	-110	-125	-126	-135
Plant operations	453	49	67	-47	-45	-43	-40	-45	-52	-56	-60
Molding specialist	456	135	140	116	83	-22	-111	-142	-177	-179	-183
Mechanical engineer	135	30	32	13	-35	-36	-45	-47	-43	-43	-46

Demand vs. supply (# FTEs, color %)

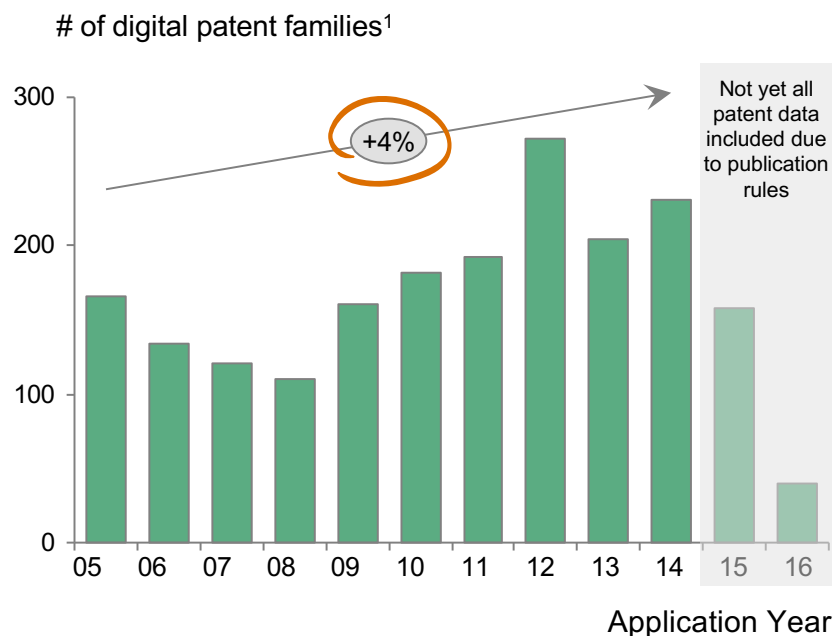
Surplus Shortfall

# Employee support and Interventions encouraged throughout multi-divisional careers

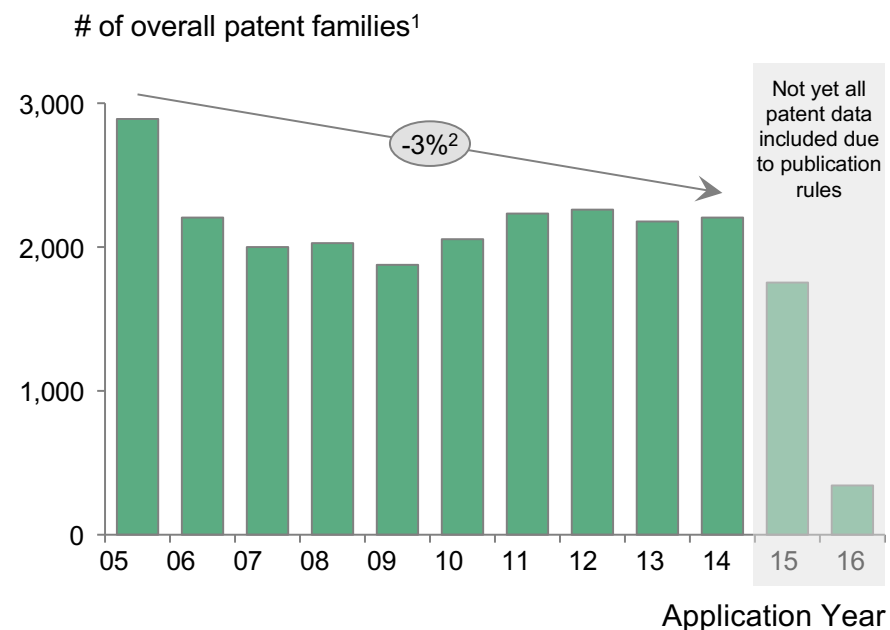


### 3. Increasing interest of Oil & gas players in the digital field

#### Increasing number of Digital patents ...



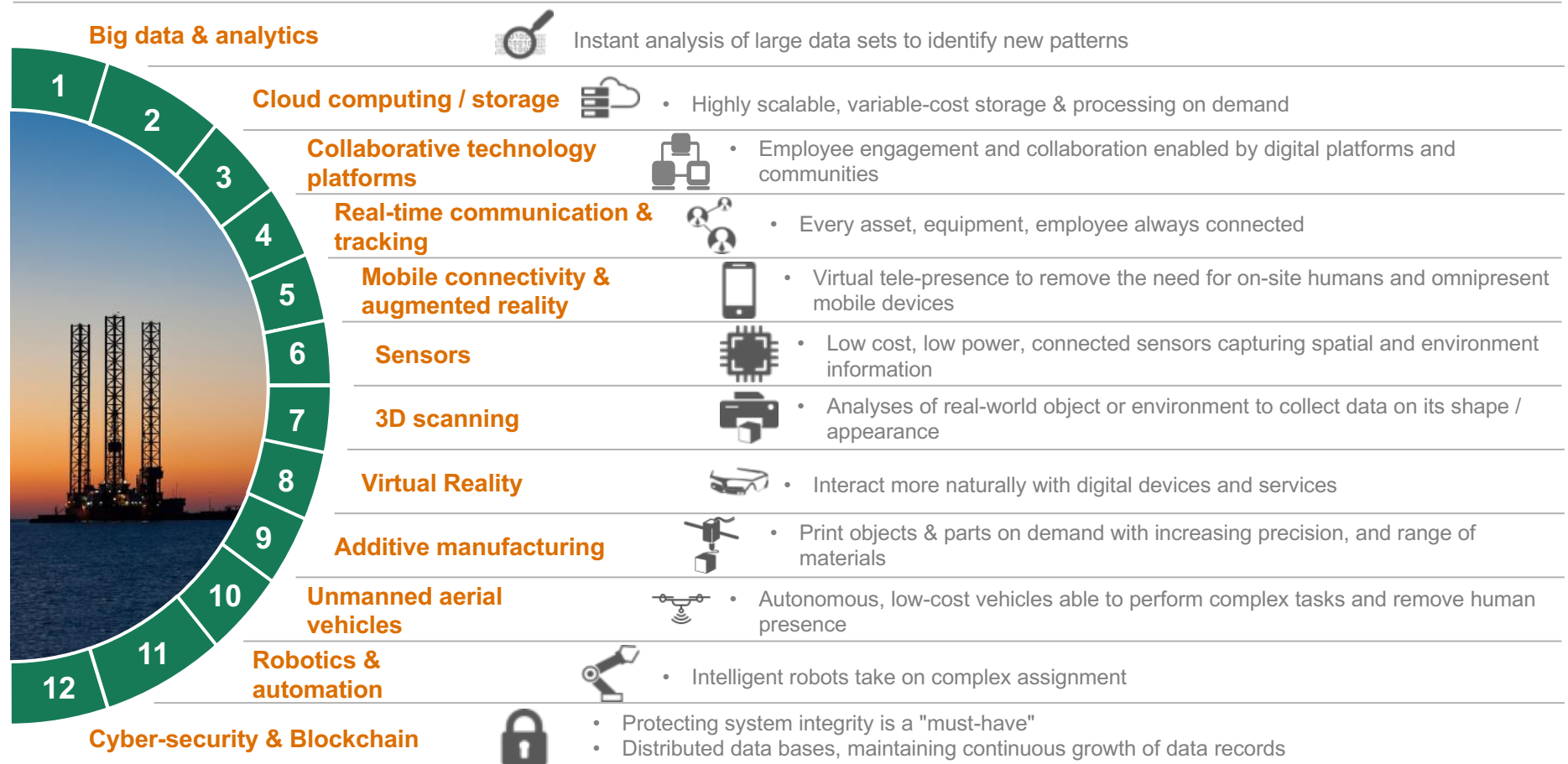
#### ... despite a slightly decreasing<sup>2</sup> patent activity



**CAGR of 4% for patents related to "digitization"**

1. Patents of ExxonMobil, Total, Chevron, Shell, BP and Saudi Aramco included 2. Declining with 3% if CAGR from 2005 on; stable with 0% if CAGR from 2006 on  
Note: Analysis based on ~24k patent families in the space of oil & gas for selected players filed since 2005; data for 2015 and 2016 incomplete due to publication rules  
Source: Thomson Innovation, BCG

# Twelve technology drivers impacting O&G



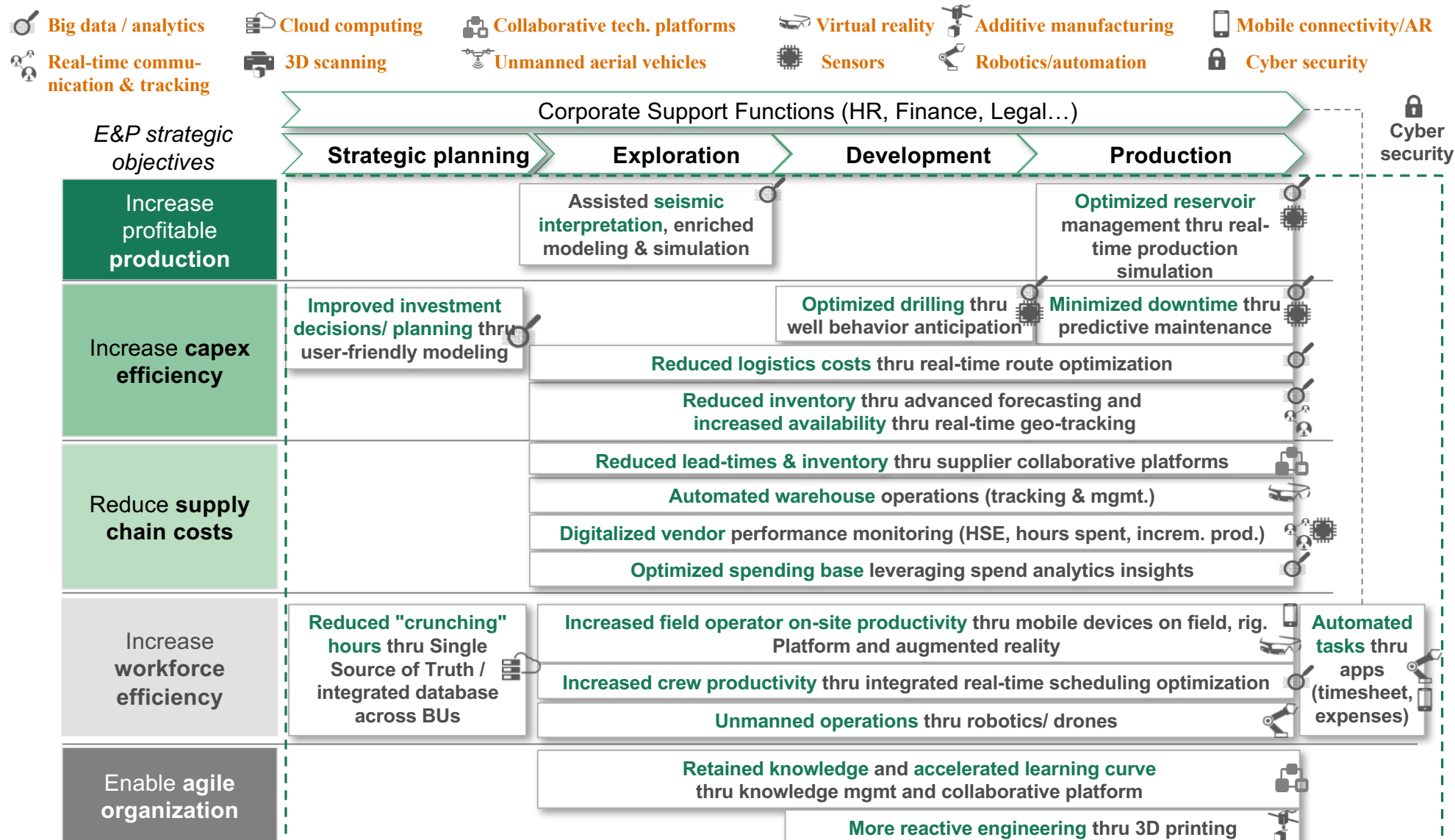
SOP – Standard operating procedure; ERP – Enterprise resource planning; SCM – Supply chain management; MES – Manufacturing execution system; CRM – Customer relationship management  
Source: BCG Manufacturing



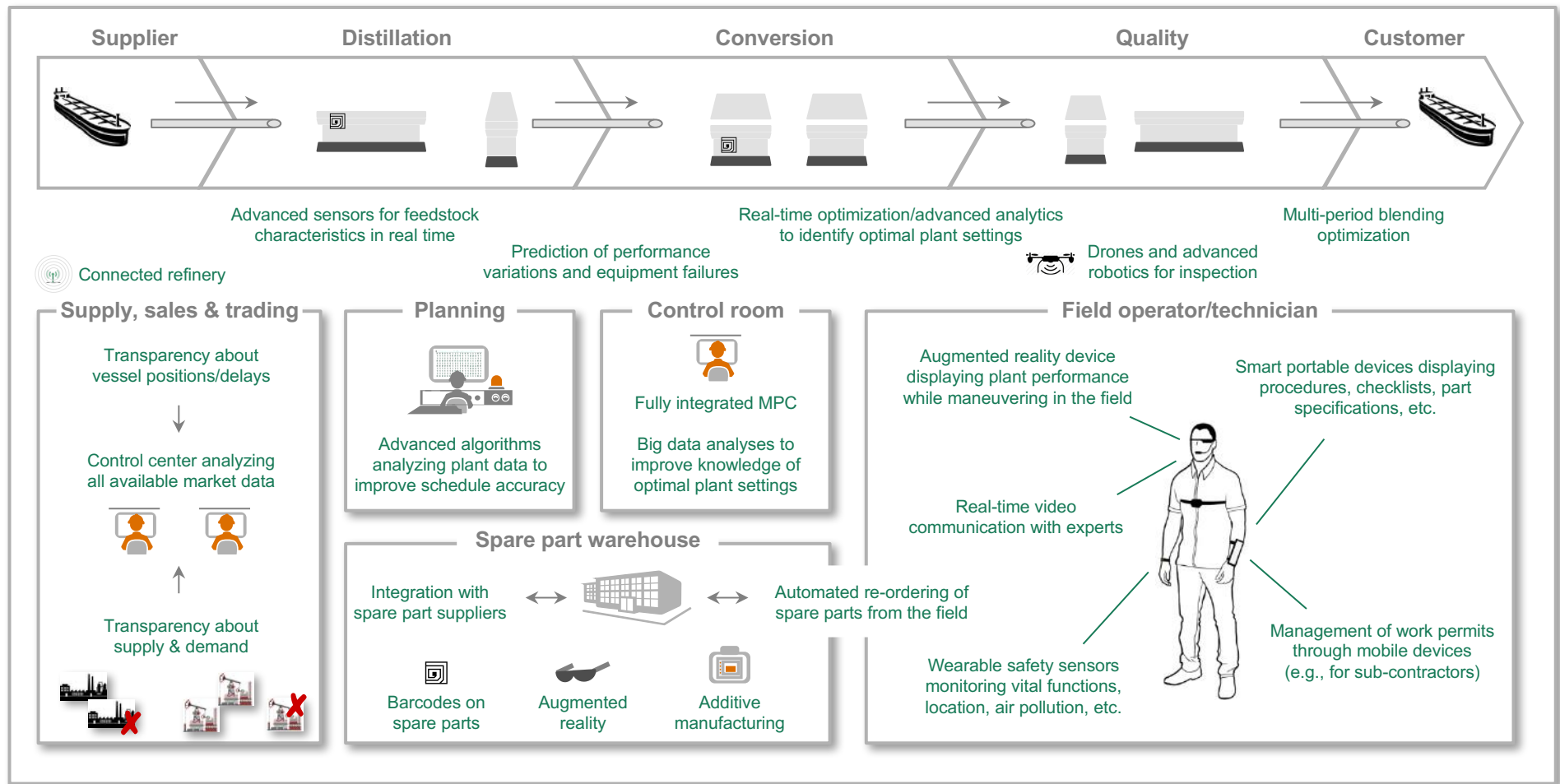
# For instance, many digital technologies are applicable along E&P value chain...

Example of use cases (non-exhaustive)

Digital  
mindset  
irruption



# ... and Refining will also be enhanced by digital technologies



# Example 1: optimized warehouse operations using augmented reality

## Description

### Augmented reality glasses used for picking in warehouses

- Warehouse personnel can use augmented reality glasses with navigation and data display in real time to assist with picking and kitting inside warehouses
- For example, Bechtel uses (a) wearable headsets with battery life for one shift and (b) vision picking software with navigation and integration into warehouse management system

**Schlumberger**



## Impact

**Improves picking process speed by ~25%**

**Increases workforce productivity**

**Allows for real-time quality control**

## Technology

**Virtual reality**



## Example 2: Real-time optimized field crew scheduling

### Description

Dynamic Optimization Tool (DOT) is an algorithm that pairs field maintenance technicians and Work Orders on real-time availabilities, taking into account:

- Field tech skills and average performance to solve the issues
- SLA requirements
- Access/ work permit restrictions

#### The tool leverages

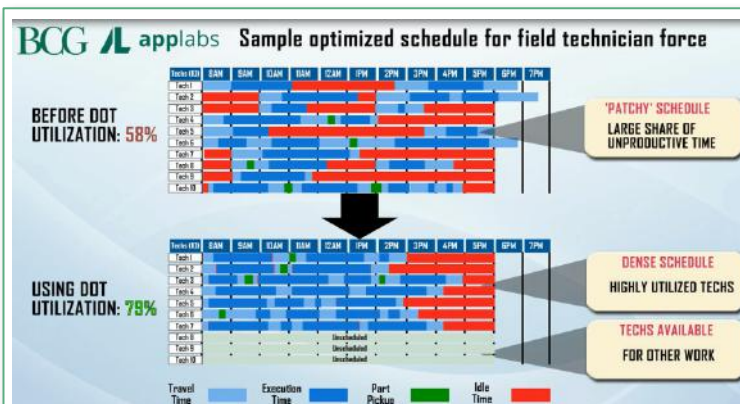
- Data ranging from public services like Google's predictive traffic algorithms
- Company internal data (e.g, technician-specific average work order resolution)

### Impact<sup>1</sup>

**-25% workforce needed for the same demand**

**+10% more work orders done by technician**

**-45% of time needed to arrive at work order location**



### Client feedback

*Going into this I thought our field force was running pretty well, I didn't see much, if any, savings to be captured. At this point I am a true believer –*  
Vice President, global technology services provider

### Technology

**Big data & analytics**



**GPS tracking & mobility**



**Minimum Viable Product (MVP) developed thru Agile methodology**

Source: BCG case experience 1. Impact measured on an on-field pilot for an IT material seller maintenance crew

## Example 3: HR mobile apps enable higher on-site productivity

### Description

**Tedious process to file expenses, needing company laptops**

- Manual attachment of receipts, filling details etc

**Mobile expense management apps. simplify expense filing**

- On-the-go and centralized archiving of receipts

**Leverage image-recognition, mileage tracking via GPS to automate filing process**



### Impact

**~80% time savings per employee**

- Claimed by certain apps

**Internal "digital facelift"**

- Internal PR value of removing day-to-day annoyance

### Technology

**Mobile connectivity & AR**



**Cloud storage**

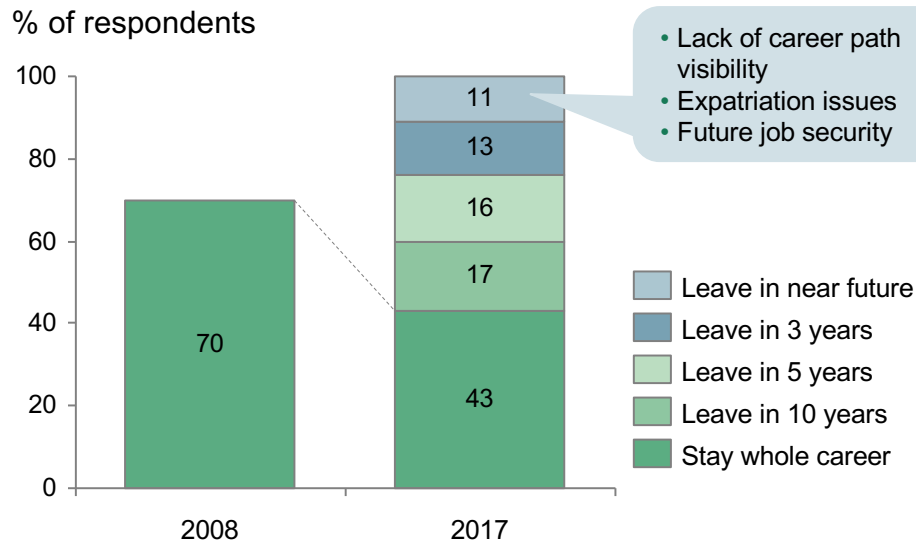


## 4. Oil & gas sector is becoming less attractive to join



**Only 43% of O&G young professionals plan to remain in the industry (vs. 70% in 2008)**

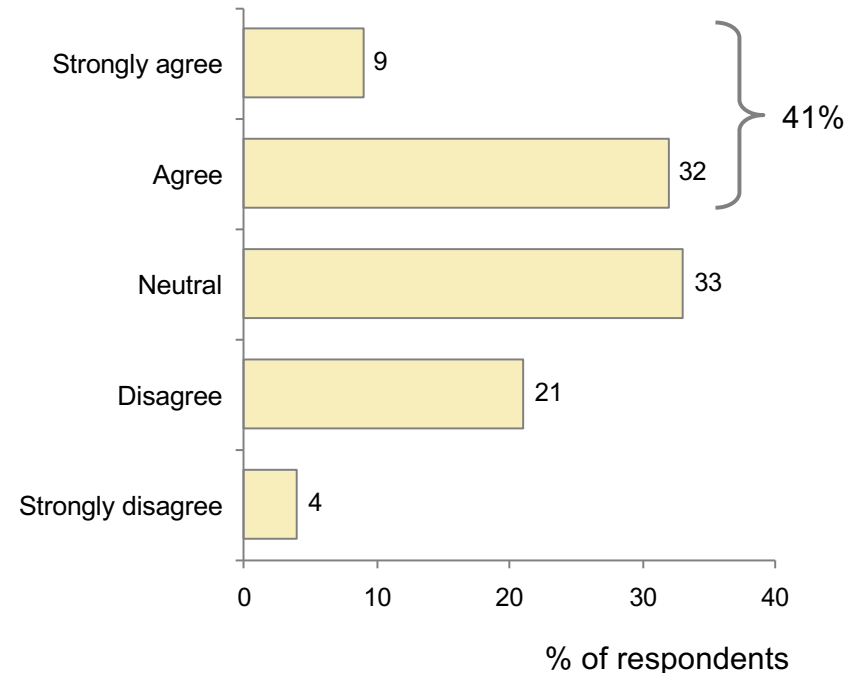
*Is your intent to remain in O&G industry?*



**Young professionals are no longer seeking a long term career**

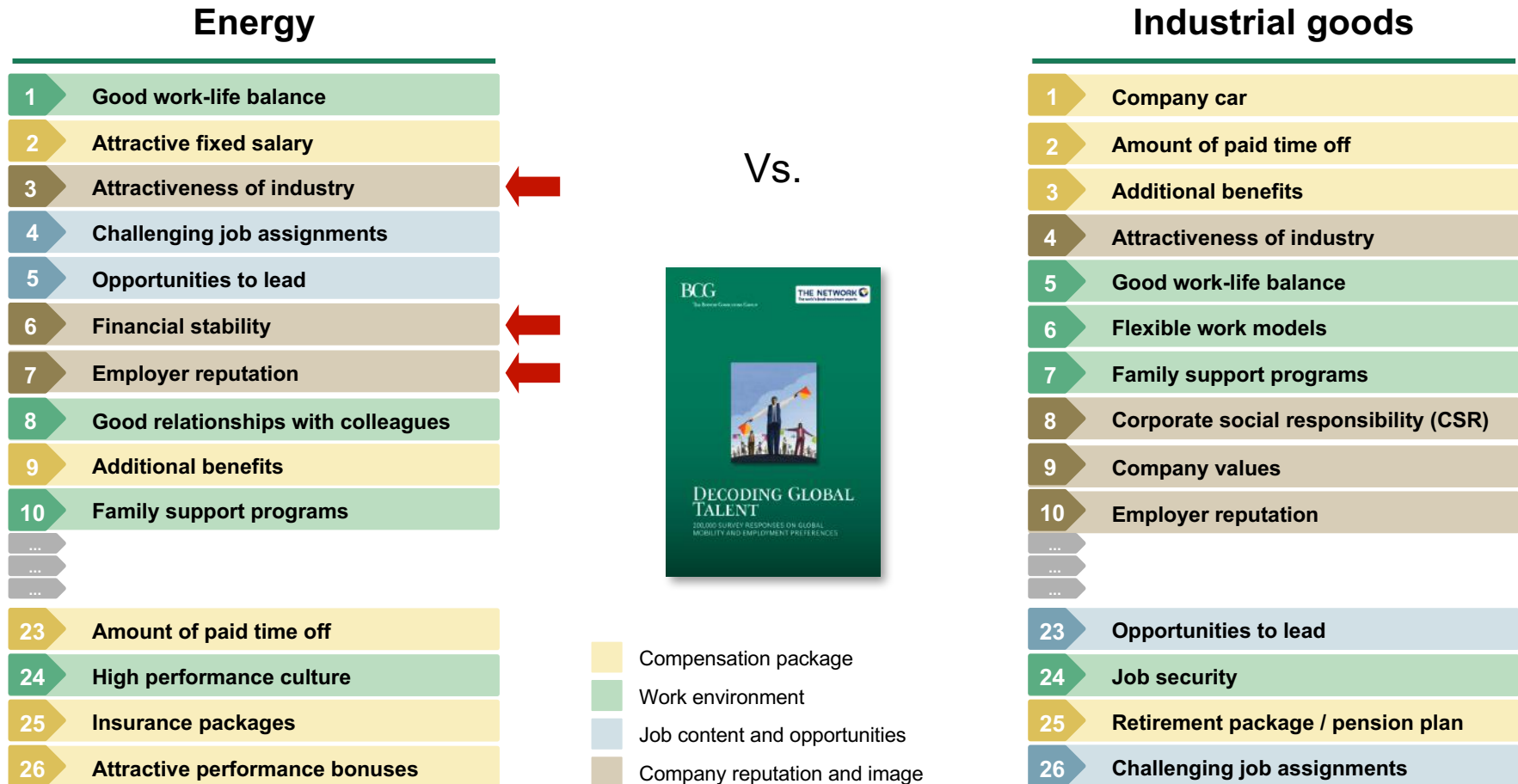
**41% of O&G young professionals believe that industry is well perceived from outside**

*Do you think that the oil and gas industry has appropriate messages in the media?*



# Company reputation factors are key in the industry

Comparison of between Energy and Industrial goods sectors



Source: 2014 BCG/The Network proprietary web survey and analysis.

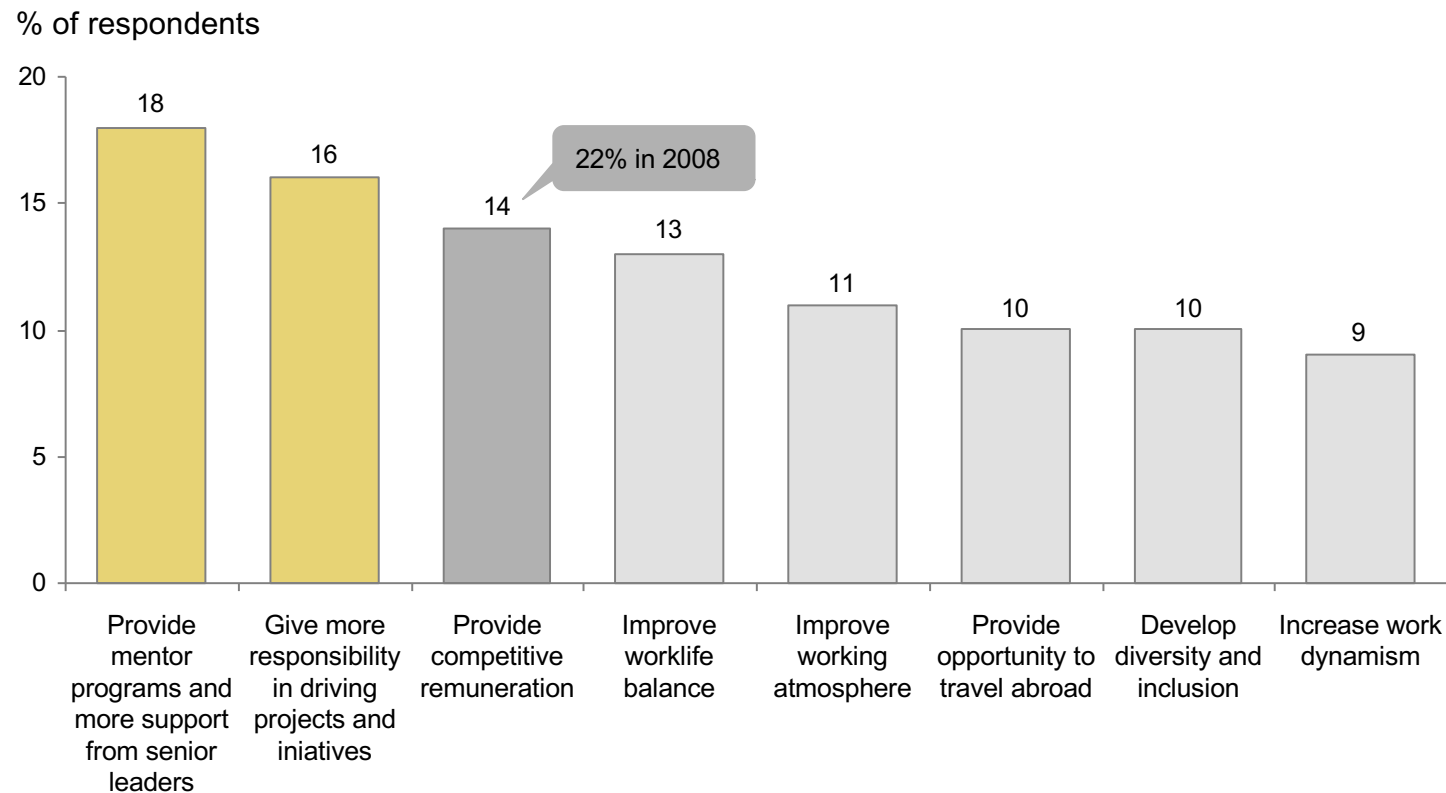
Note: Based on responses from energy industry; sample size was 9,044 and responses from industrial goods industry; sample size was 41,696.

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# Young professionals value mentoring programs and business trust as key retention drivers

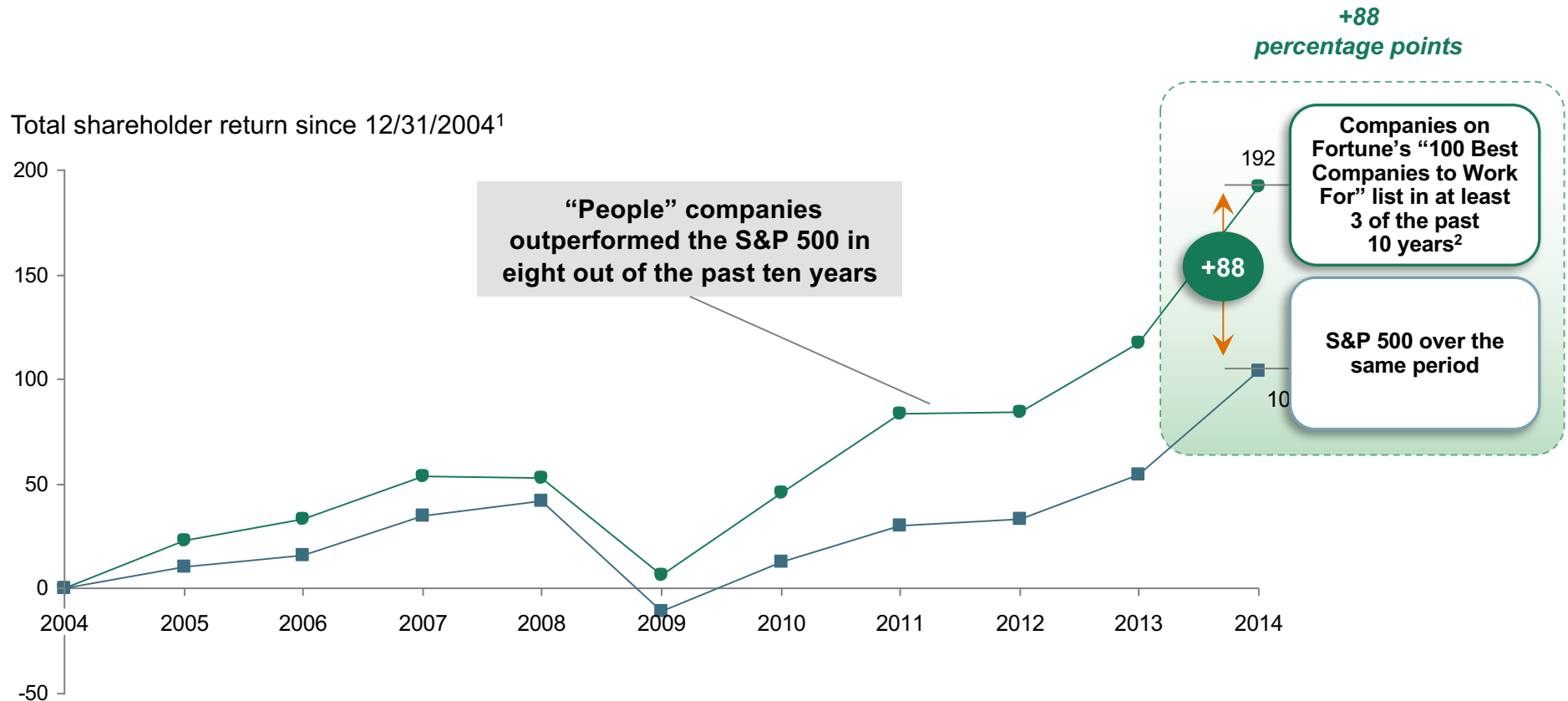
*What needs to be done to retain your talent in the energy industry?*



**It's no longer about the money...Young Professionals mindset is changing, towards recognition and learning**



# "People" companies outperform the market average



**Top "People" companies have +88 percentage points advantage in TSR over the last 10 years**

1. Total shareholder return represents compounded median annual total return for stocks of publicly-traded companies that appeared on Fortune's 100 Best Companies To Work For" list 3 times in the past 10 years and total return for the S&P 500 index over the same period; 2. Publicly-traded companies that appeared on Fortune's "100 Best Companies To Work For" list 3 times in the past 10 years;

Source: Fortune; S&P Capital IQ; BCG ValueScience Center


## 5. Gender diversity matters

Reason	Description	Quotes
Women are half the talent pool	Women represent more than half the <b>talent pool</b> with more women graduating from colleges than men for the past years	<i>"Women represent half if not more of the talent pool: they are ambitious, highly educated and ready to join the workforce"</i>
Women bring different perspectives	Women bring different perspectives to the workplace, in line with their <b>different aspirations, conceptions</b> and general way of thinking	<i>"Women contribute differently in the boardroom, compared to their male colleagues"</i> <i>"Women represent 50% of consumers and thus understand consumers' needs and talk their language"</i>
Women add diversity to the workplace	Diversity in the workplace stimulates <b>higher productivity and creativity</b> which in turn translates into better leadership team	<i>"A diverse employee pool results in higher productivity and higher level of creativity and engagement"</i> <i>"Functional diversity and diversity of experience play a positive role in building better leadership teams"</i>
Women have a differentiated skill set	Women rank higher than men in certain skills related to empathy and feelings enabling them to build <b>relationships</b> and develop and motivate their teams	<i>"Women bring empathy and intuition to leadership, they possess greater awareness of the motivations and concerns of other people"</i> <i>"Women score higher than men in nurturing competencies such as developing others and building relationships"</i>

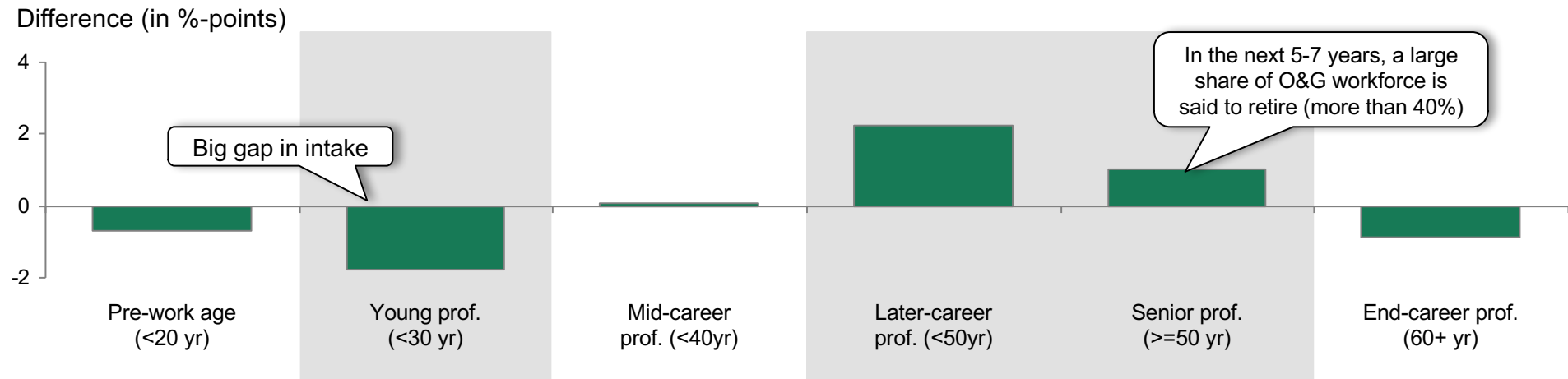
Source: Financial Times; RSA, the Executive Search firm

# O&G companies can no longer afford to ignore 50% of the world's talent pool in their supply chain

Gender diversity

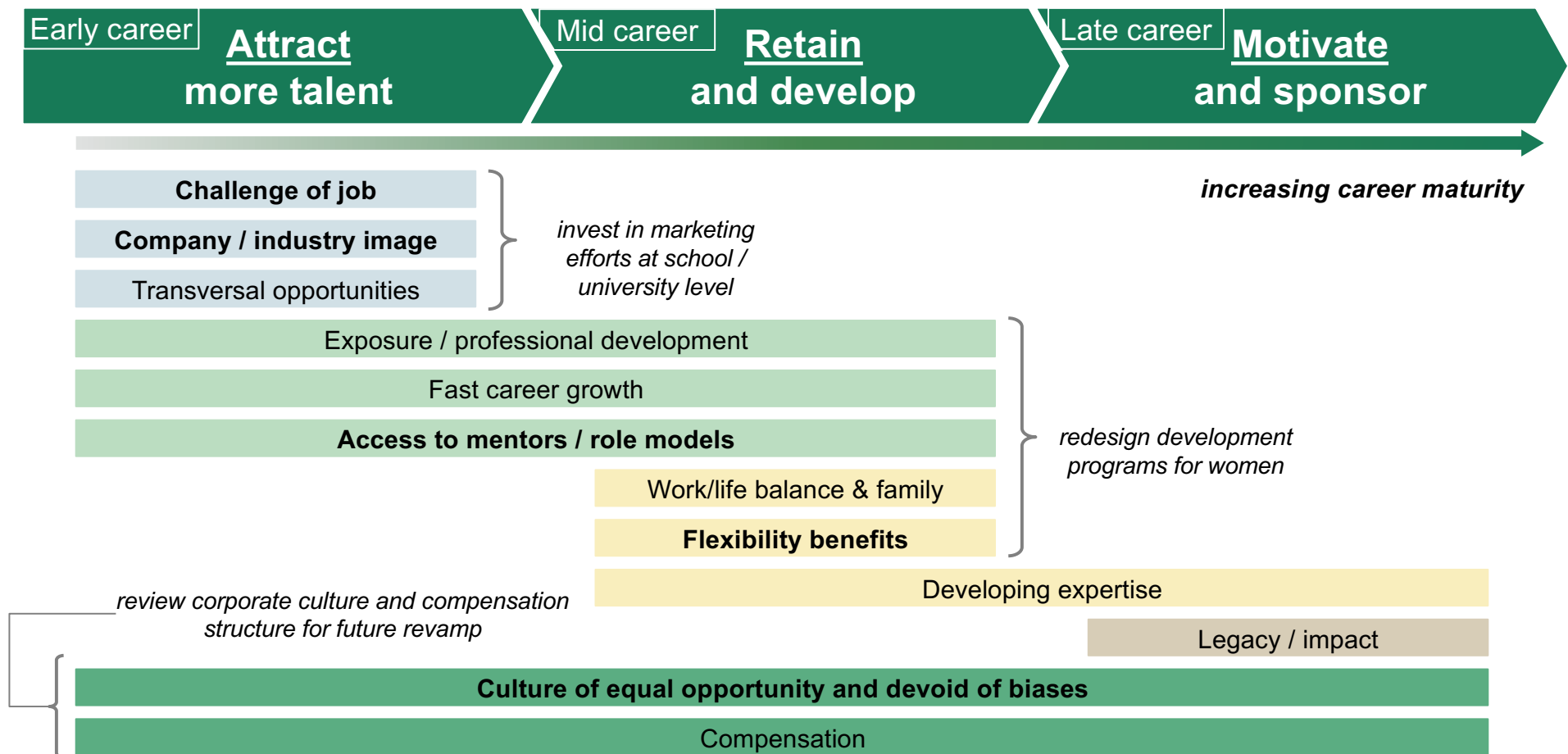



*Population of Mining & Quarrying professionals compared to world-wide average age distribution<sup>1</sup>*



1. Analysis across 52 countries; looking at percentage point delta between age distribution in Mining & Quarrying (incl. oil & gas extraction) vs. overall working population; not weighted; does not include some large oil & gas producing countries (notably: missing KSA, Russia, Mexico, UAE)  
Source: UN population & labor statistics (data ranges from 1999 to 2011 – selected latest available data point per country)

# Motivating factors for women change across career stages



**Bold** – more O&G relevant

# O&G faces challenges in attracting top female talent



**Fewer women with STEM degrees**

- Although STEM intake is increasing in areas like Psychology and Social Sciences, women are not flooding natural sciences / engineering / construction<sup>1</sup>

**Perception of O&G as male dominated**

- 25% of female workforce felt unwelcome in O&G, due to perceiving the industry as "male dominated"<sup>2</sup>

**Low social acceptance among women of O&G**

- "Society still thinks about oil covered roughnecks when speaking of the oil industry" - becoming a deterrent to women joining workforce<sup>2</sup>

**Travel / job / expatriate challenges**

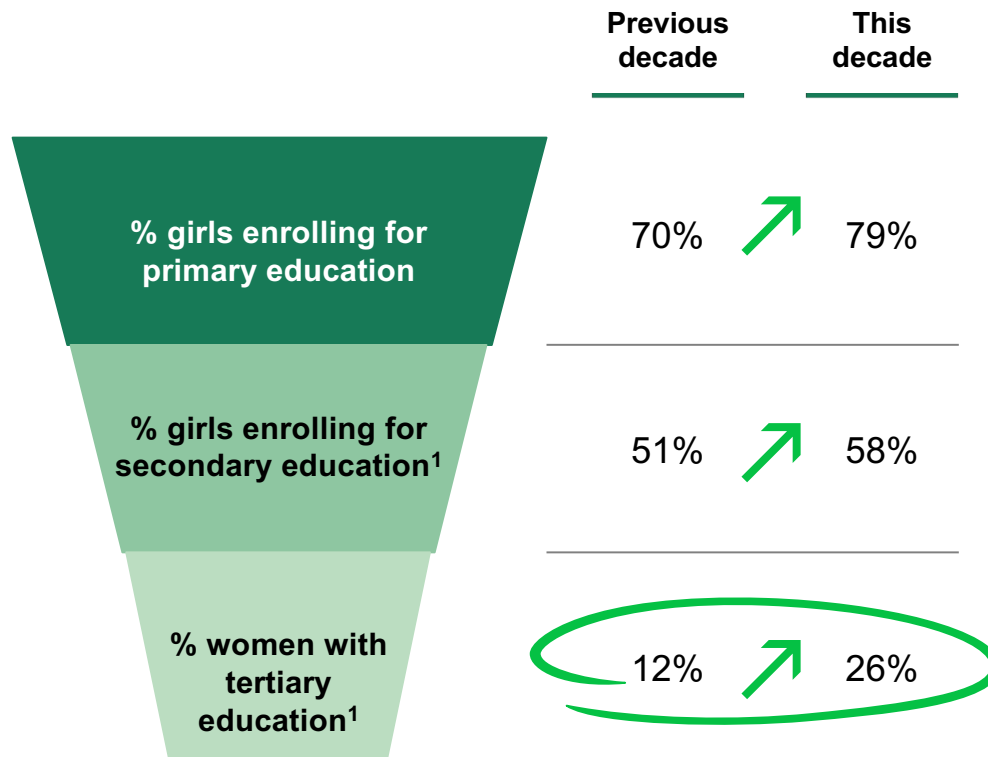
- "Women [tend to] shy away when told during recruiting about 20 hour shifts or work in remote locations"<sup>2</sup>

Compensation is not an off-setting factor

1. NSF – Women, Minorities in Science & Engineering. 2. NES Global Talent

# Despite overall success in education, O&G industry faces a unique intake problem

Women education definitely on strong upward trend over last decade, esp. tertiary education



However, O&G faces challenges to tap into the female talent pool

US: 18%  
WW: ~7%

Women in tertiary education taking up STEM coursework, esp. CS & engg.

Oilfield reputation driving away STEM educated women

*"I always get questions about why I work in an oil company when I could have taken a desk job elsewhere"<sup>3</sup>*

# There are quite a few substantial mid-career blockers



## Work-life balance challenges

- 39% women mentioned they would consider taking less money for more flexibility and work-life balance for a few mid-career years<sup>1</sup> (may not be O&G specific)

## Perceived promotion and compensation bias

- 45% women feel less recognized compared to men in O&G<sup>1</sup>
- Gender wage gap in O&G estimated ~5.4%, largest across industries<sup>2</sup>

## Inadequate professional development / outdated career models

- Disproportionate emphasis on 'cutting your teeth' offshore in order to progress to leadership

Digital oilfield and new technologies might shift that view

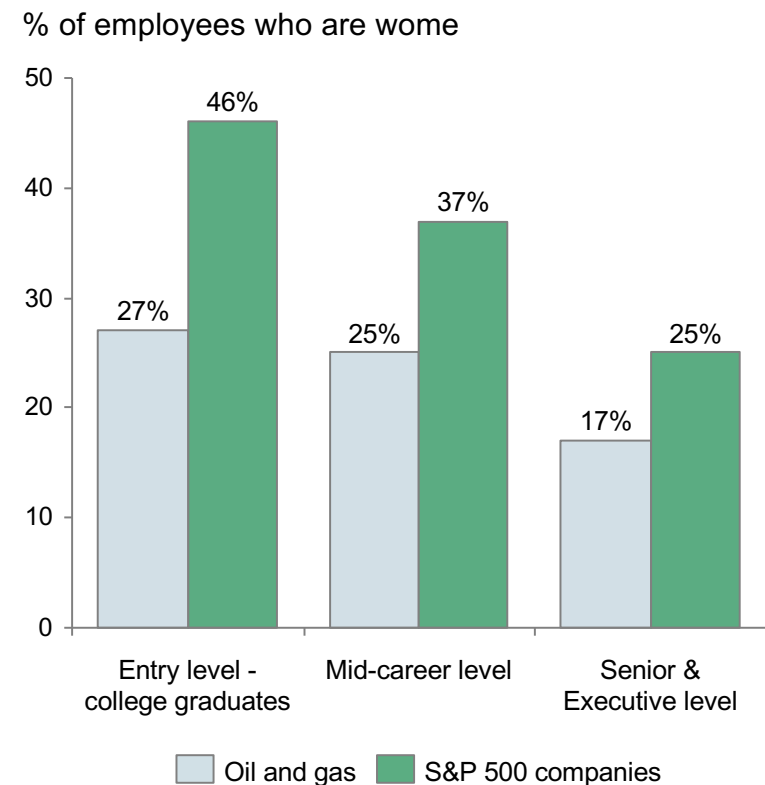
1.NES Global Talent. 2.Fast Company & Payscale crowdsourcing

# Women are substantially underrepresented in the Oil and Gas industry

**Women constitute 38% of the workforce in major oil-producing nations but only 22% of employees in oil and gas**



**Women's underrepresentation within the industry spans all levels of seniority but worsens as seniority rises**





## And what about female executives in O&G?



### Few success stories / role model

- 95% females said mentorship was important for their development in O&G, but 42% were neither a mentor nor a mentee<sup>1</sup>

### Unintentional male benevolence

- Men might say things like "she might want to have a support/office job with less travel or hours"<sup>1</sup>

### Confidence / risk averseness

- "...women need to feel 100% qualified before they raise their hands, men's threshold is only 30-40%"

# Governments, oilfield players and industry influencers are taking steps to bridge the gender gap

## Governments

### **Impetus for women inclusion can be strong, if originated at the policy level**

- Nordic/western society has begun to implement **equal paternity leave** to promote sharing of family burden and effect a cultural change

## Industry players

### **Oil companies and OFS providers have instituted policies for women inclusion**

- Industry players have realized the importance of joint efforts: 22 O&G companies pledged to reduce gender gap at the World Economic forum
- Most companies today have executive positions responsible for "Diversity & Inclusion" and have dedicated policies and an annual reporting cadence
- Formerly conservative Middle Eastern companies, such as ADNOC (UAE) had 25% recruitment target for women and managed to exceed target, recruiting ~30%

## Industry influencers

### **Industry consortiums and forums are catalyzing women inclusion via spirited campaigns. Couple of pertinent examples below -**

- Heforshe is a gender equality campaign instituted by UN, targeted at men and boys to engage them as agents of change, very relevant to O&G
- Pink Petrol is an effort led by Halliburton manager to foster women in O&G
- WPC/BCG report to be published in July 2017

# Leading players have set and achieved ambitious targets

## Illustrative examples

### Some players have already taken significant steps

Oil & Gas industry has taken note of the urgency to close the gender gaps



#### Has 2 women leadership development programs:

- Women's Career Development Program (**WCDP**)
- Senior Women Connect (**SWC**), designed for women in leadership positions
- Women represent **19% of senior leadership**



- **Target to have over 30%** female graduate hires through continued efforts to highlight the depth and breadth of careers at BP
- Has an **Women's International Network** and local women's networks at many of their sites around the world



- Has a **high representation of women on their Corporate Executive Committee** and in senior management
- **33% of workforce** are women across all groups and businesses

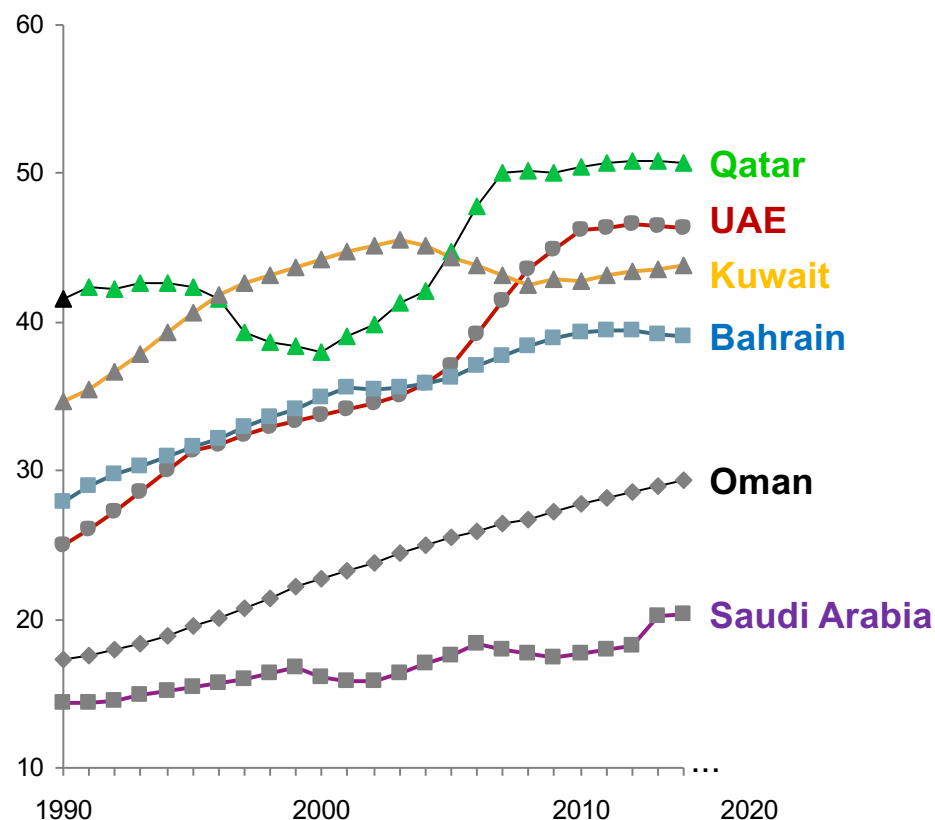


- **10 initiatives in Women Development Program** incl. Woman in Leadership, mentoring and peer learning
- Appointed **first women leader as executive director** in 2015

# Women labor participation already on the rise across the GCC

## Women labor participation historically...

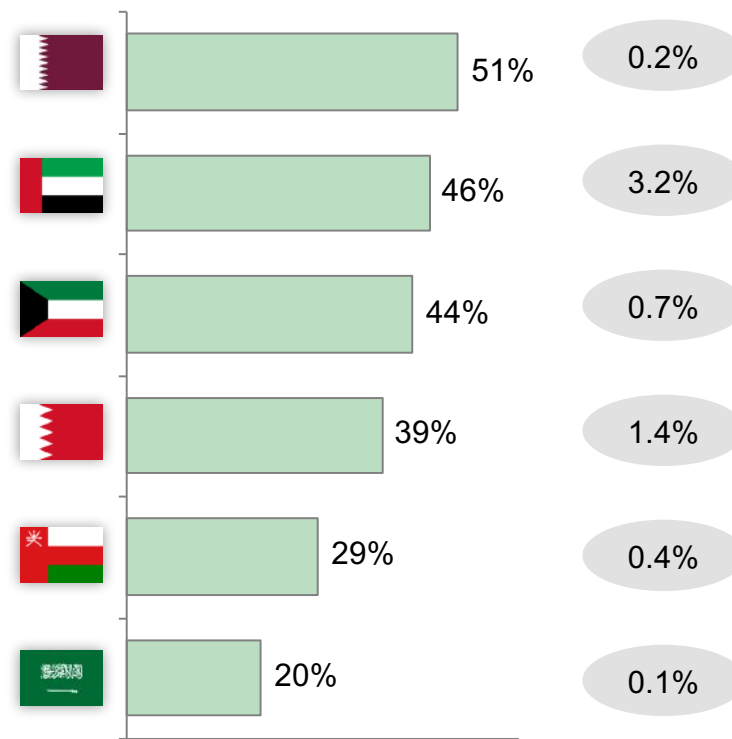
Labor force participation rate, female  
(% of female population ages 15-64)<sup>1</sup>



## ...and today

Labor force participation rate, female  
(% of female population ages 15-64)

**CAGR  
2009-2014:**



Source: World Bank, ADNOC sustainability reports

# Further reading material



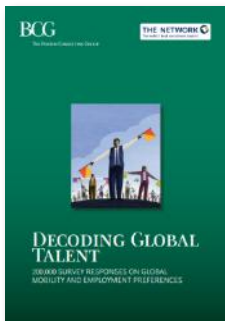
## The New New Way of Working

Twelve Forces That Will Radically Change How Organizations Work



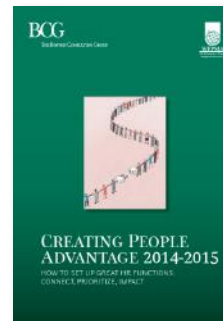
## Man & Machine

Impact of Industry 4.0 on the Global Workforce



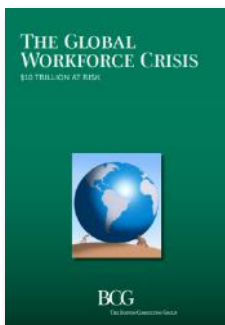
## Decoding Global Talent

Survey of Over 200,000 Workers in 189 Countries



## Creating People Advantage 2014-2015

How to Set Up Great HR Functions



## The Global Workforce Crisis

\$10 Trillion at Risk



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