Oilfield chemicals

Market Development Opportunities

Daydream & Dynovel Highlight
What are the difficulties of working in the Oil & Gas production industry?

- Complex value chain
- Broad range of oil field chemicals
- Mature market
- Numerous players
- "Greener" production
- Evolving technologies

Revenue of 75 largest oil production and exploitation companies in 2012:

$1,246.5 billion
As a producer of chemicals, you want to...

- **Improve products and technologies by:**
  - Extending your Product Portfolio
  - Adapting the chemicals portfolio to the constant changing technologies in the Oil & Gas exploration and production
  - Revisiting the oilfield chemicals requirements that might fit use your chemical intermediates features

- **Have quicker access to prospective customers by:**
  - Having direct connections to Blenders, Oilfield Services Companies, NOC or IOC companies
  - Improving your Channel-To-Market organization and design capabilities
  - Identifying the most suitable players to strategically partner with in the fields of oil and gas technologies

- **Support your strategy planning by:**
  - Developing your Production Assets and being able to estimate capacity
  - Having an updated understanding of your competitors activities in Asia, Europe, North America and South America

Daydream provides a unique portfolio of Consulting Services to help you answer your questions.
As a blender, oilfield service company or an IOC/NOC, you want to...

- **Support your growth activities by:**
  - Identifying new suppliers in expanding regions

- **Search for innovative technologies to meet your evolving needs by:**
  - Identifying green chemistries that can replace hazardous products
  - Sourcing new chemical products with innovative technical features (technology transfer to Oil & Gas)

- **Provide your In-field Services partners formulation support such as:**
  - Hydraulic fracturing formulations
  - Improved Oil Recovery
  - Enhanced Oil Recovery...

Daydream provides a unique portfolio of Consulting Services and knowledge to help you to answer your questions.
Daydream’s Services  
Expertise of O&G over 15 years

- **With 15 years of global projects in the Consulting Industry dealing with:**
  - A variety of chemicals products & technologies,
  - Combined with its deep understanding of the Oil & Gas market’s structure & organization
  - As well as its extended network of experts and key industrial players

- **We have developed a strong expertise in the Oil & Gas Industry which enables us to build a global comprehensive master Database which:**
  - Is dedicated to this Industry and correlating key players/activity/chemicals/properties
  - Aims at facilitating the development of New Business opportunities for our clients.
Daydream’s Services
Unique consulting service portfolio to answer your questions

**Tool A: Mapping of Oilfield Chemicals (OFC) players & products**

*Bring growth to your business by expanding the applications and prospective customers which are out of your traditional lists*

**Tool B: Market Focus on specific topics**

*Bring growth to your business by further understanding specific chemicals provided by your company and their targeted markets*
Daydream’s Services
Unique consulting service portfolio to answer your questions

**Tool A:** Mapping of OFC players & products:
*Bring growth to your business by expanding the applications and prospective customers which are out of your traditional lists*

**Database:**
All Products + Applications + worldwide Suppliers

**Specific Database:**
Group of Products + Applications + Suppliers + Contacts ID

**Tool B:** Market Focus on specific topics

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Tool A: Mapping of OFC players & products
A tool to efficiently connect with your partners

There are dozens of functions and hundreds of types of OFC applied in all steps of Oil & Gas productions, how can you make sure that you have a full understanding about the positioning of your products in the value chain?

- If you want to source specific chemicals for developing new formulations
- If you want to further understand the positioning of your competitors in the Value Chain
- If you want to identify a business opportunity for your product portfolio based on a function requested by the Oil & Gas market
- If you want to have an overview of who is operating and where

We are able to build a tool which maps the Value Chain of the Oil & Gas industry as well as a comprehensive list of players segmented by Applications and/or Region in the Value Chain.
Tool A: Mapping of OFC players & products
Illustration: Global Model and link

If you are a producer of chemicals: red case
If you are a Blender or Oilfields Services company and IOC / NOC: Blue case
Tool A: Mapping of OFC players & products
List of chemicals products

- Production list:

Approx. 450 Chemicals products

- (Meth) acrylic acid esters
- (N-Dodecyl)trimethylammonium bromide
- 1-(2-Hydroxyethyl)-2-methyl-5-nitroimidazole = (metronidazole)
- 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride
- 1,2-Benzothiazolizol-3-one
- 1,2-Dibromo-2,4-dicyanobutane
- 1,2-Dimethyl-5-nitro-1H-imidazole
- 1,3,4-Thiadiazole-2,5-dithiol
- 1,3,5-Tris-(2-hydroxyethyl)-s-triazine
- 1-Hydroxy-5-methyl-4-phenylimidazoline-2-thione
- 1-Hydroxyethylidene-1, 1-disphosphonic acid
- 1-N-Hexadecyl-1,2,4-triazole bromide
- 1-Phenylalkanesulfonates
- 2,2-Dibromo-2-nitroethanol
- 2,2-dibromo-3-nitriolpropionamide (DBNPA)
- 2,3-Dibromo-1-chloro-4-thiocyanato-2-butene
- 2,4,6-Trihydroxybenzoic acid
- 2,4,8,10-tetra-oxaspiro-5,5-undecane
- 2,4-Diamino-6-mercapto pyrimidine sulfate (DAMPS) combined with oxysalts of vanadium, niobium, tantalum or titanium, zirconium, hafnium
- 2,4-Pentanedione-1,5-sodium disulfonate
- 2,5-bis(N-Pyridyl)-1,3,4-oxadiazole
- 2,6-Dimethyl-m-dioxan-4-ol acetate
- 2-Bromo-2-bromomethylglutaronitrile
- 2-Bromo-2-nitro-1,3-propanediol
- 2-Bromo-4-hydroxyacetophenone
- 2-Hydroxyphosphono-acetic acid
- 2-Mercapto benzothiazole
- 2-Mercaptobenzoxazole
- 2-Mercaptothiazoline
- 2-Methoxy-3-isobutyl pyrazine and 4-methyl-4-mercapto-2-pentanone

...
Tool A: Mapping of OFC players & products

List of functions

- Functions:

  - Asphaltenes treatment
  - Biocides
  - Clay Stabilizers
  - Completion Fluids
  - Conductivity Enhancer
  - Corrosion Inhibitor
  - Coupling Agents
  - Crosslinkers
  - Demulsifiers
  - Dispersants
  - Drag Reduction
  - Emulsifiers
  - Flocculants
  - Fluid Loss Additives
  - Foam Control
  - Foaming agent
  - Free-fluid inhibitor
  - Friction Reducer
  - Gas Hydrate Inhibitor
  - Gel Breakers
  - Gelling agent
  - H₂S Scavenger
  - Lubricant
  - Odorization
  - Oxygen scavenger
  - Permeability control
  - pH Control
  - Polymer Coatings
  - Pour Point Depressants
  - Proppant
  - Proppant Resins
  - Retarders
  - Rheology Modifier
  - Sand Consolidation Aid
  - Scale Inhibitors
  - Shale Swell Inhibitor
  - Solvents
  - Surfactant
  - Suspension Aid
  - Thickener
  - Viscosity Control
  - Waterflooding
  - Weighting Agents
  - Wetting Agent
Tool A: Mapping of OFC players & products
Value Chain and Companies

- Companies and position in the Value Chain:

Raw materials Intermediate Producers → Speciality Chemical Producer → Oilfield Chemicals Formulators → Oilfield Service Company → Oil & Gas Exploration

### Companies

- ..... 
- Saint-Gobain Proppants
- Samson Oil&Gas
- Sandridge Energy
- Sanjel
- Santrol
- Sasol
- Schlumberger
- Scomi Oilfield Services
- Sekisui Speciality Chemicals
- Select Industries Inc
- Seneca Resources Corp
- Sepecor Inc
- Seppic
- Setac
- ShawCor
- Shell Chemicals
- ..... 
- ..... 
- Shin Etsu /SE Tylose
- Shrive Chemicals
- Sibelco/Unimin
- Signa
- Southwestern Energy
- Stepan
- Sterling Chemicals
- Sumitomo Bakelite
- Sun Drilling Products
- Suncor
- Superior Energy Services
- Swift Energy Company
- SymOil Energy
- Syncred
- Synthexyme
- Syrgis Performance Chemicals
- .....
Tool A: Mapping of OFC players & products
Results illustration

Illustration of Mapping results:

Relation between Chemical Manufacturers, Chemicals Products, Function, and Application:

<table>
<thead>
<tr>
<th>Raw material or intermediate</th>
<th>Company</th>
<th>Chemical Product</th>
<th>Function</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauxite</td>
<td>Saint-Gobain Proppants</td>
<td>Sintered Bauxite</td>
<td>Ceramic Proppants</td>
<td>Fracturing Fluids</td>
</tr>
<tr>
<td>Phenol</td>
<td>Santrol</td>
<td>Phenol Formaldehyde coating</td>
<td>Resin Coated Proppants</td>
<td>Fracturing Fluids</td>
</tr>
<tr>
<td>Acrylamide</td>
<td>Santrol</td>
<td>Polycrylamide coating</td>
<td>Self Suspending Proppant</td>
<td>Fracturing Fluids</td>
</tr>
<tr>
<td>Fatty alcohol</td>
<td>Sasol</td>
<td>Fatty alcohol Ethoxylates</td>
<td>Surfactants</td>
<td>Drilling Fluids</td>
</tr>
</tbody>
</table>

Our research direction

Relation between Oilfield Service companies and Value Chain Segment:

<table>
<thead>
<tr>
<th>Oilfield Service company</th>
<th>O&amp;G Segment</th>
<th>Proprietary Products/Technologies</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanjel</td>
<td>Hydraulic fracturing</td>
<td>Fracturing Fluids</td>
<td>(N_2) energized, Visco-Elastic Surfactant based fracturing fluid</td>
</tr>
<tr>
<td>Sanjel</td>
<td>Hydraulic fracturing</td>
<td>Fracturing Fluids</td>
<td>Borate based fracturing fluids</td>
</tr>
<tr>
<td>Sanjel</td>
<td>Canadian Oil Sand</td>
<td>Thermal Cementing</td>
<td></td>
</tr>
</tbody>
</table>

Our research direction
Example of data: Drilling Fluids

Role:
- Cool and lubricate the drill bit, increasing the rate of penetration during drilling.
- Provides sufficient hydrostatic pressure to prevent the escape of gas and oil during drilling.
- Ensures the well remains clear by transporting rock cuttings to the surface and preventing rock dispersion.
- Prevents fluid and solid invasion into the rock formation.
- Stabilizes the well as it is being drilled, thereby avoiding damage to the production zone.

Water-based *
- A mineral to control the weight/density of the mud.
- A bridging solid to encourage the formation of a filter cake within the well.
- Wetting and thickening agents to tailor the rheology of the mud.
- Salts to aid well stabilization particularly for shale formations – for oil-based muds these salts are contained in aqueous emulsion droplets.

Drilling Mud or Fluids

Oil-based

* For water-based Drilling Mud: other additives such as starches and polymers may also be used, for example to prevent fluid loss, particularly when drilling shale.
Tool A: Mapping of OFC players & products
Example: Drilling fluids – focus on value chain

- Example Drilling Fluids

<table>
<thead>
<tr>
<th>Company name</th>
<th>Location</th>
<th>Chemicals/Ingredients offered</th>
<th>Function</th>
<th>Contact name</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalian Xingyuan Chemistry</td>
<td>China</td>
<td>DBPNA</td>
<td>Biocide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep South Chemical</td>
<td>USA</td>
<td>Thioctarbamate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOW Chemical</td>
<td>USA</td>
<td>Glutaraldehyde</td>
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<tr>
<td>MacLube Oil Co</td>
<td>USA</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>M-I SWACO</td>
<td>USA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anton Oilfield Services</td>
<td>China</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baker Hughes</td>
<td>USA</td>
<td></td>
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</tbody>
</table>

Conclusion: We are able to provide you with a comprehensive list (*) of current players in every step of the Oil & Gas Production chain. Whether providing, formulating or buying every possible chemical involved in the process.

(*) List illustration:
- Chemistry - Product - Function for Oilfield Chemicals
- Company - Raw material (sometimes) - Product/Function - Applications
- Chemical Manufacturer their Chemistries – Product - Function - Applications
- Oilfield Service Company - Application fields - O&G Segments + proprietary technologies - Innovations
Daydream’s Services
Unique consulting service portfolio to answer your questions

**Tool B: Market Focus on specific topics**
Bring growth to your business by further understanding of specific chemicals provided by your company and their target markets
Tool B: Market Focus on specific topics
Market Focus

“In the oil service and drilling markets, one year is quite a while, two years is a long time, and five years is an eternity. Things can change very quickly in this cyclical business”

- The US shale oil & gas market has confirmed this old rule:
  - Massive step changes have occurred in shale development methods, now unlocking extraordinarily difficult-to-access O&G resources at a pace unimaginable only five years ago
  - Shift from shale gas to shale oil
  - Environmental pressure & water scarcity
- If your last update about shale gas is > 3 years old, it’s time to REVISE!
- If you want to evaluate the potential of your products which could be used in new technologies of oil production & exploitation...

Daydream is specialized in designing tailor-made market assessments on the Chemicals Oil & Gas market, from macro to micro point of views and Business Strategy Design.
Tool B: Market Focus on specific topics
Illustration of our knowledge on O&G market

Source: Permeability range of producing formations and where fracturing is needed for extraction (King 2012- Dalhousie University)
Tool B: Market Focus on specific topics
Illustration of our knowledge on O&G market

Projected growth of enhanced oil recovery among major producers

North American Horsepower Supply

Top 10 Countries - Technically Recoverable Shale Gas Resources

Rank | Country
--- | ---
1 | China
2 | Argentina
3 | Algeria
4 | U.S.
5 | Canada
6 | Mexico
7 | Australia
8 | South Africa
9 | Russia
10 | Brazil
World Total

International Frac Capacity (MM HHP)

Country-wise increase in frac capacity 5 years growth of 243%

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Tool B: Market Focus on specific topics
Example: Hydraulic fracturing market

- North America holds 90% of the global hydraulic fracturing production
  - US is the largest market followed by Canada, China, Russia and Argentina.
  - US Oilfield Service companies Halliburton, Schlumberger, Baker Hughes, Weatherford, Trican, Champion Technologies (Ecolab) and Flotek are leading suppliers of fracturing services and in-house developed chemical solutions.
  - These leading companies operate worldwide and have local cooperation e.g. in China.
- Main challenges for hydraulic fracturing market:
  - Rapid depletion of reservoirs production squeezes profitability
  - Cost pressure: low US gas prices have turned shale gas boom into a shale oil boom
  - High water and energy consumption (for pressure pumps)
  - Public concerns about environment & workers health (silica dust) impacts
- Main trends in hydraulic fracturing market
  - Shift to less water demanding fracturing fluids e.g. energized fracturing fluids (N₂ /CO₂)
  - Recycling of all water back into the fracturing fluid circuit
  - Improved environmental profile of chemicals throughout the entire process
Daydream & Dynovel Presentation

Cologne, Shanghai, Philadelphia, 2014
Daydream & Dynovel introduction

- B to B services delivering concrete Marketing and Business Development solutions readily operational for your business by providing you with a highly skilled and efficient team of Consultants.

- We bring the best services, geographical coverage, flexibility and efficiency to our worldwide clients. We provide the best local teams in each region (North America, Europe and Asia) and leverage the same global proven methods and tools that have been developed by Daydream for more than 15 years to deliver high quality results!
Oilfield chemicals
Market Development Opportunities

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