The background of the slide is split diagonally. The top-left portion shows a close-up of white, cube-shaped sugar crystals. The bottom-right portion shows an industrial facility with numerous white pipes, metal structures, and storage tanks, likely a refinery or chemical plant.

# **SIBUR**

COMPANY  
PRESENTATION

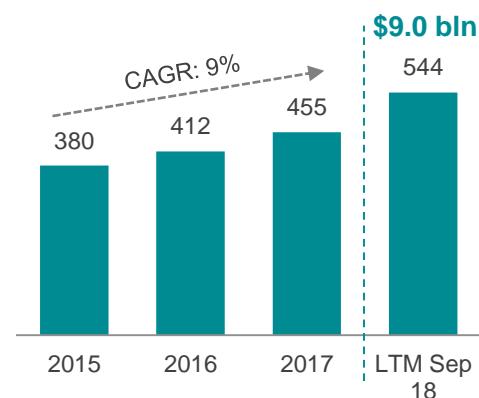
# SIBUR AT A GLANCE

## Key Facts

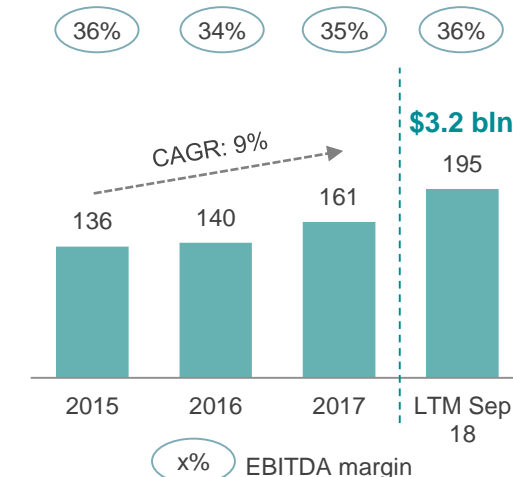
- Leading EM petrochemical company
  - Would be a top-10 petrochemicals-focused public company by 2017 EBITDA (c.\$3 bln, with strong further growth potential on the back of ZapSib - major expansion project)
  - Average EBITDA margin of 35% over last 3 years (30%+ in average since 2010)
- Production base in West Siberia – a region attractive for petrochemical operations thanks to abundant low-cost feedstock (LPG and naphtha)
  - export-bound transportation costs and duty results in attractive prices for the stranded feedstock in West Siberia
  - barriers to entry due to SIBUR's extensive infrastructure in the region
- Close-to-completion (89%) 2mtpa polyolefin ZapSib project is expected to triple SIBUR's Olefins & Polyolefins (O&P) capacity
  - Total investment budget: \$9.0 bln<sup>1</sup>, c.70% already financed as of 30-Sep-18
  - Our recently launched O&P project in the same geography delivered EBITDA margin of 55% in 2017
- Net Debt/EBITDA of 1.6x as of Sep-18; Baa3/BB+ rated by Moody's/Fitch
  - Net debt at c.\$5 bln corresponds with ZapSib accumulated capex (c.\$6 bln as of 30-Sep-18)

## Key Financials

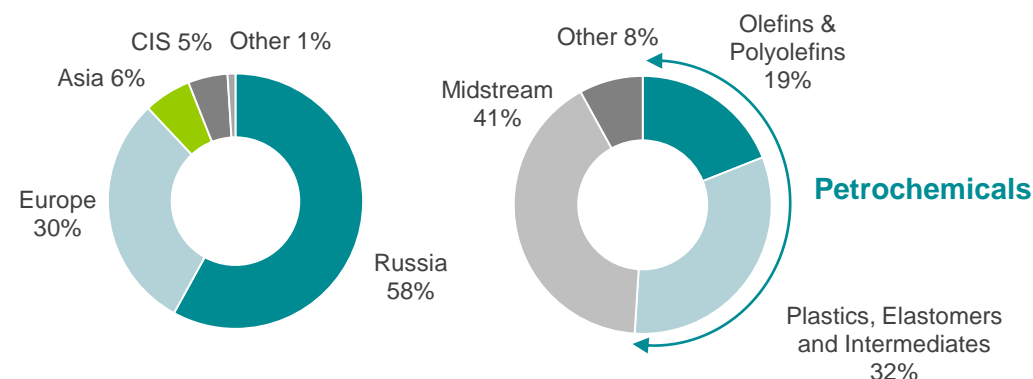
### Revenue, RR bln



### EBITDA, RR bln



## Revenue Split by Segment and Geography, 2017



c.90% dollar-linked revenue<sup>2</sup>

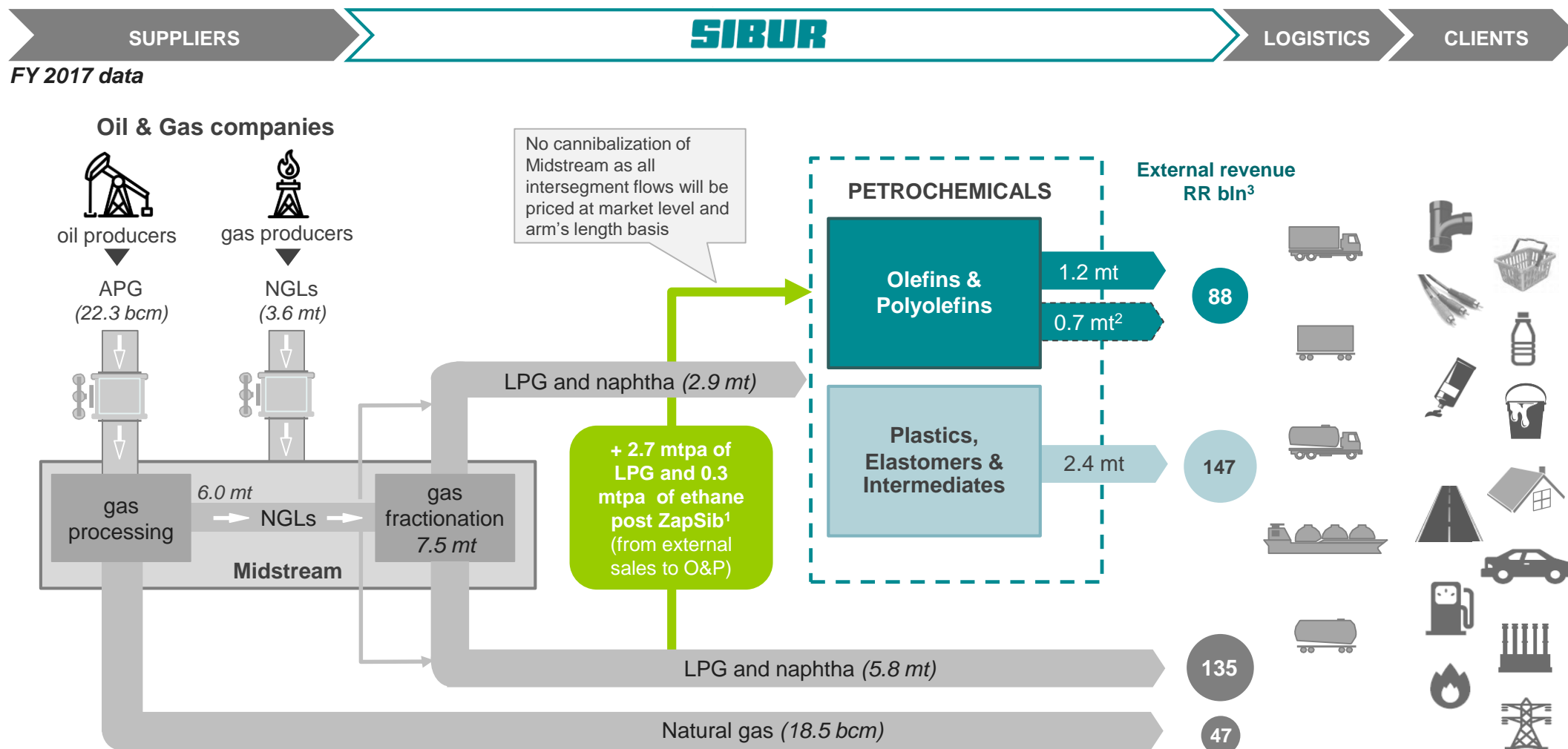
Source: The Company data

(1) Estimated capex budget. Translated into USD using historical annual average exchange rates. Residual capex Calculated based on exchange rates as of 30 Sep-18: RUB/\$ at 65.6, RUB/EUR at 76.2.

(2) Except natural gas

# BALANCED INTEGRATED BUSINESS MODEL

Complementary Petrochemical and Midstream Businesses Operating on Market Terms Enables Smoothing Cash Flow and Earnings Volatility



## Definitions:

- Associated petroleum gas (APG) is a by-product of oil production
- Natural gas liquids (NGLs) include raw NGL, LPG (liquefied petroleum gas) and naphtha. Raw NGL is a by-product of gas production
- Feedstock includes LPG, naphtha and raw NGL. Composition may vary from year to year depending on market conditions and other limitations

Source: The Company data

Note: Represented scheme includes LPG and naphtha purchased from third parties for resale, as well as certain LPG and naphtha volumes produced directly from APG processing

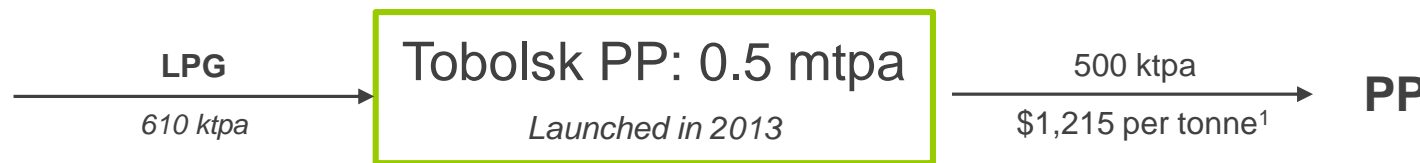
(1) Capacity additions estimates of the Company of 500 kt for PP, 1,500 kt for PE. (2) JV sales include share of PVC, caustic soda (RusVinyl) and PP (Poliom) sales.

(3) Other revenue for the FY 2017 (not indicated on the graph) – RR 38 bln

# SIGNIFICANT UPSIDE FROM WORLD-SCALE ZAPSIB PROJECT AND FURTHER POST-ZAPSIB GROWTH PROJECTS

ZapSib Is a Scale-Up and Extension of Tobolsk PP Plant Experience

## Tobolsk PP Plant



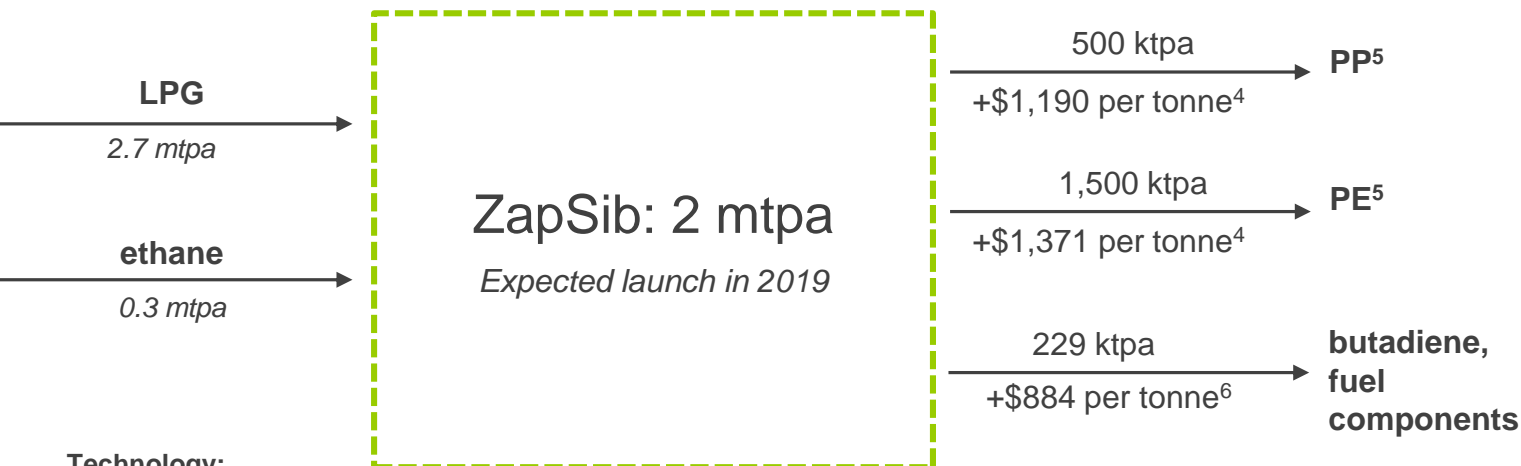
### Technology:

**PDH (propane dehydrogenation); licensor UOP**  
**Gas-phase polymerisation; licensor INEOS**

## 2017 Results

- 510 kt PP output achieved
- \$342 mln EBITDA contribution
  - 55% EBITDA margin (average EBITDA margin of 63%<sup>2</sup> since fully launched)
- RR 57 bln (~\$2 bln) CapEx

## ZapSib (Project in Progress)<sup>3</sup>



### Technology:

**EPB cracker; licensor Linde AG**

**PE unit: gas-phase polymerisation (Innovene FullFlex) / suspension polymerisation (Innovene) licensor INEOS**

**PP unit: Spheripol; licensor LyondellBasell**

## Key Features

- Scale-up of the Polyolefin capacity, combined with more stable and easily-manageable Ethylene production technology
- Introduction of new grades of PE (HDPE and LLDPE)
- Management team, experienced in construction, commissioning and running modern Polyolefin Plant
- Established distribution channels, and sales teams well-prepared for further expansion

Source: The Company data

(1) Average SIBUR selling prices (FY2017) calculated using exchange rate of 58.3 RR/\$. (2) Calculated as average EBITDA margin over 2016-2017. (3) ZapSib capacity figures are estimates of the Group. (4) IHS actual 2017 prices. PE blended price for HDPE and LLDPE. (5) 50% China / 50% Russia. (6) Weighted average price for fuel components and butadiene (94 ktpa of butadiene, 135 ktpa of fuel components) calculated using exchange rate of 58.3 RR/\$.



# SIBUR MIDSTREAM INFRASTRUCTURE

SIBUR Owns and Operates Midstream Infrastructure Securing Feedstock Supply to Its Chemical Business



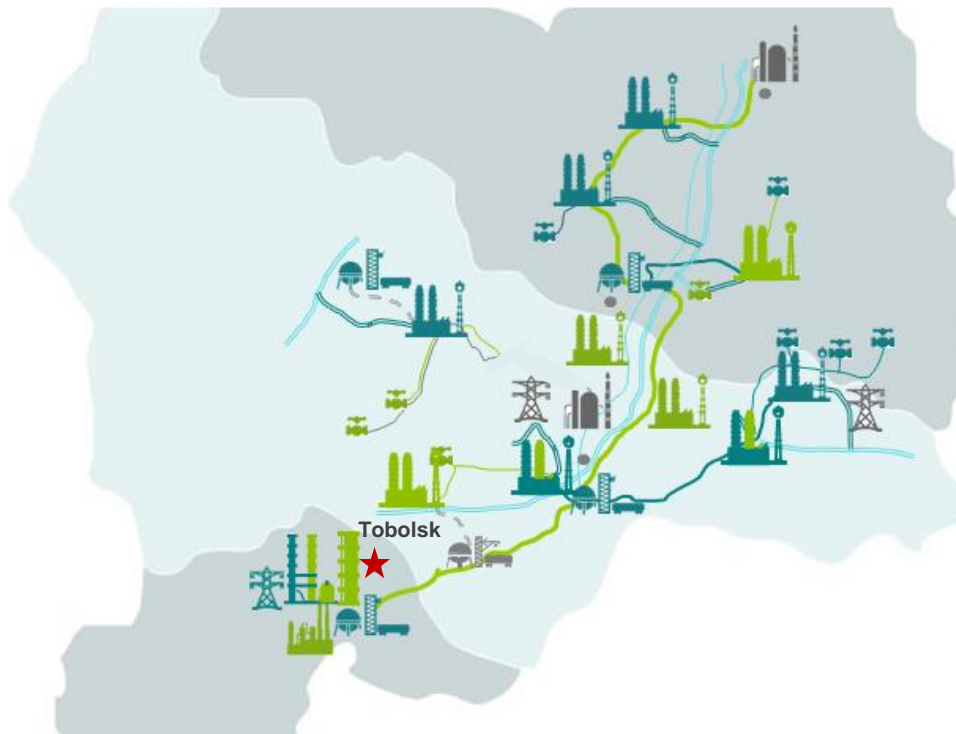
## SIBUR Asset Base in Western Siberia

**25.4<sup>1</sup>** bcm  
APG  
processing

**9.5<sup>2</sup>** mln t  
Gas  
fractionation

**8** GPPs<sup>1</sup>  
out of 10  
operating in region

**2,712** km  
Pipeline network



Scale: 1cm= c.90km

■ SIBUR infrastructure ■ SIBUR newly constructed / upgraded assets ■ Third-party infrastructure

1

Russia's **largest and most extensive integrated infrastructure** for processing and transportation of APG and NGLs

- 57% of APG produced in Russia<sup>3</sup>
- 71% of raw NGL produced in Russia<sup>3</sup>

+

2

**c.90%** of annual supplies are **guaranteed by long-term contracts** with weighted average maturity of **c.15 years**

+

3

**No third party** gas processing additions in the region **over last two decades** while SIBUR doubled processing capacities and modernized legacy transportation infrastructure by investing \$4.4 bln

Source: the Company data, CDU TEK and companies' data

Note: As of 2017FY

(1) Including Yuzhno-Priobskiy GPP, JV between SIBUR and Gazprom Neft. (2) Including Uralorgsintez (0.9 mtpa) divested in April 2017 (capacity is used under long-term processing arrangement). (3) Estimate based on CDU TEK and companies' data (FY2017)

# R&D Centre of SIBUR is NIOST LLC

## ■ The goals of NIOST

- Ensuring technical competitiveness of SIBUR through the development and implementation of new advanced technical solutions and technologies

## ■ Strategic tasks of NIOST

- Implementation of R&D projects according to Company R&D program
- Formation and implementation of R&D initiative projects in priority development topics
- Realization of continuous monitoring of the latest world scientific achievements, development of forecasts and complex programs of the scientific and technical development
- Localization and development of scientific staff



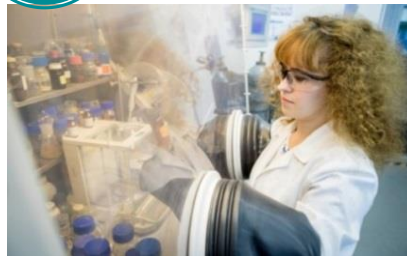
### DEPARTMENT FOR NEW PRODUCTS AND TECHNOLOGIES



- ✓ development of new technologies for the production of existing monomers and organic synthesis products
- ✓ search, testing and development of effective catalysts, dehumidifiers with the involvement of leading specialized Russian and foreign centers
- ✓ Expansion of the brand assortment of plasticizers and acrylic esters based on SIBUR raw materials



### DEPARTMENT FOR CHEMISTRY AND POLYMER PROCESSING



- ✓ a wide range of research to expand the Company's product portfolio in the field of base polymers, compounds, as well as work to improve the efficiency of existing industries
- ✓ All research directions are focused on a specific consumer and the introduction of the developed materials into production.
- ✓ technical support of industrial sites SIBUR



### TECHNOLOGICAL PROCESSES OPTIMIZATION DEPARTMENT



- ✓ scientific and technological surveys of the existing units
- ✓ simulation and optimization technological processes
- ✓ R & D and investments projects management
- ✓ BPP development
- ✓ search and implementation of non-standard technical solutions and technologies for the intensification of technological processes



### TESTING-LABORATORY CENTER



- ✓ analytical studies;
- ✓ certification (approval) of raw materials and materials for SIBUR production sites

# TECHNOLOGICAL PROCESSES OPTIMIZATION

## SIBUR LLC, Moscow

1. Creation the process from idea to result
2. Goal-setting
3. Portfolio management

## NIOST LLC, Tomsk

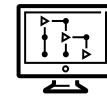
### PROJECT MANAGERING GROUP

- Ideas generating
- First evaluation of engineering and economics
- Project-management of investment projects from pre-project engineering to obtaining an economical effect



### TECHNOLOGICAL FORSIGHT GROUP

- Searching for innovative technical solutions



### MODELING CENTER

- Development of technical solutions using specific soft

## ACTIVITY DIRECTIONS

**We aimed at solution of scientific, technological and engineering tasks for optimization of existing production facilities and development of new processes**

1. Development and implementation of technical solutions that require scientific researches and aimed for improving the efficiency of existing production
2. Development of basic technological configuration for new processes and technologies
3. Value-engineering

# STRUCTURE AND PROCESS

## TECHNOLOGICAL PROCESSES OPTIMIZATION SIBUR, (MOSCOW)

Sergey Kiryasov



## TECHNOLOGICAL PROCESSES OPTIMIZATION DEPARTMENT, NIOST (TOMSK)

Margarita Kayumova



## CEEО NIOST (TOMSK)

Vladimir Bushkov



+  
Dmitry Chernishov  
Ilya Chebarev

## TECHNOLOGICAL FORSIGHT GROUP

Daria Bogomolova



## MODELING CENTER

## PROJECT MANAGERING GROUP

Khusainov Airat



### IDEA-MANAGEMENT

01.  
Ideas  
generation

02.  
First evaluation of  
engineering and  
economics

*Needs researching*

03.  
Discussion of the  
project on the  
Scientific-Technical  
Committee

04.  
Researching

### PROJECT-MANAGEMENT

05.  
Discussion of the  
project on the  
Technical  
committee

**CAPEX**

06.  
Allocation of  
financing

07.  
Design and  
construction

**OPEX**

08.  
Test run

09.  
Implementation

10.  
Effect  
monitoring

Operational efficiency improving

Long Goals

Covering of the operational efficiency gap



# MODELING CENTER. GENERAL INFORMATION (2018)

We develop technical solutions to optimize equipment operation modes, increase equipment productivity and energy efficiency.

The modelling center is engaged in the development of new processes, as well as the optimization of the existing units.

## UNIT STRUCTURE



### Fields of application

- Pinch analysis
- Advanced distillation&absorbtion modelling
- Reactor's modelling
- Polymer modelling
- Facility optimization
- APC-role assistance
- Laboratory assistance
- Scale-up calculations
- Hydraulic&corrosion pipelines calc
- Technological engineering

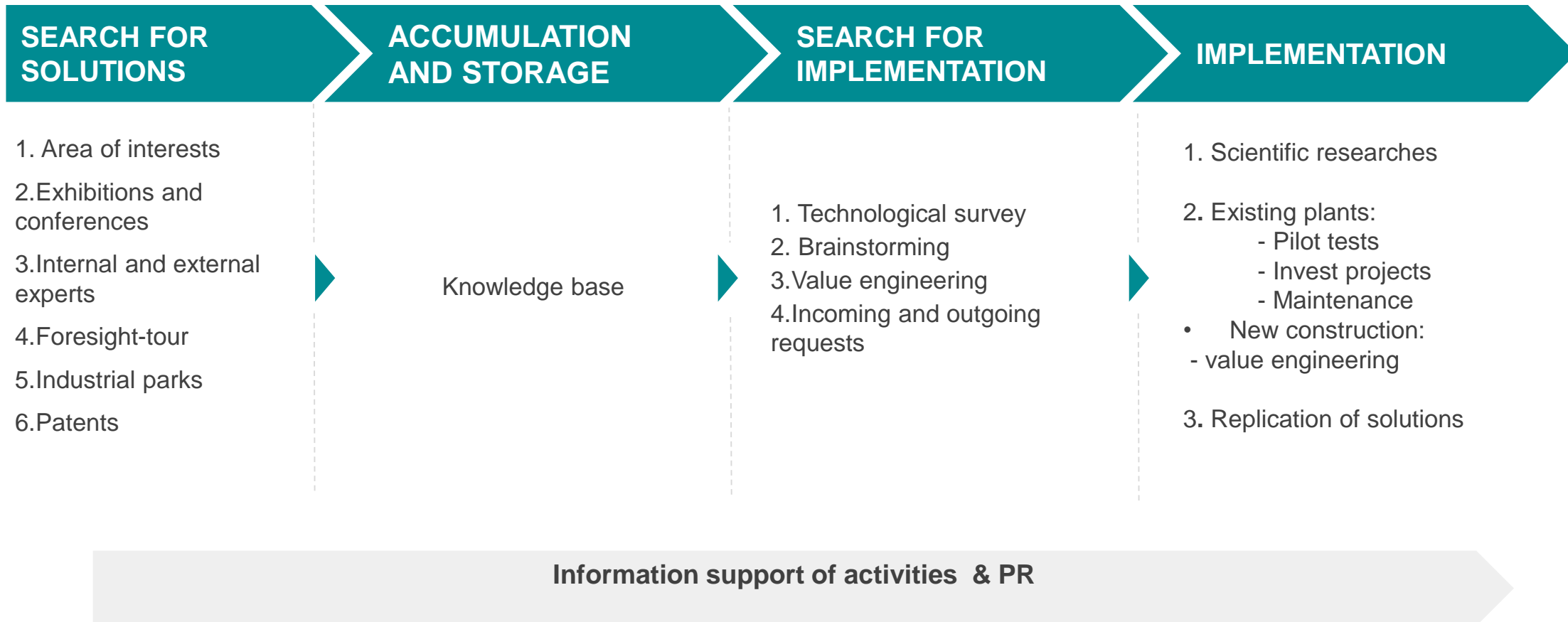
- EBITDA growth – 65 mlnUS\$

### Software usage

- Aspen EDR
- Aspen Plus - Rate based mode
- Aspen Plus&Hysys
- Aspen Polimers&PREDICI
- Aspen Plus&Hysys+EO
- Aspen Dynamics
- Aspen Properties (NIST database)
- Aspen Plus&Hysys + CFD (Ansys&OpenFOAM)
- Aspen Hysys&START Prof
- Aspen Plus&Hysys+EO

# TECHNOLOGICAL FORSIGHT GROUP

## INNOVATIONS WORK PROCESS



## TECHNOLOGICAL FORESIGHT GROUP. AREA OF INTERESTS

1. Technologies for intensifying heat transfer processes aimed at increasing the heat transfer coefficient (for liquid-liquid systems not less than  $5000 \text{ W}/(\text{m}^2 \cdot ^\circ\text{C})$ ), as well as for reducing steel-intensive (compared to traditional heat exchangers).
2. Innovative mass-transfer devices operating in a wide range of loads, providing low hydraulic resistance and high separation efficiency of components in comparison with traditional methods of hydrocarbon separation.
3. Heat exchangers with highly developed surface (specific working surface not less than  $1500 \text{ m}^2/\text{m}^3$ ), self-cleaning or not prone to driving. Technologies that prevent the heat exchangers from clogging by seal products and/or mechanical impurities (service life of at least 2 years without cleaning).
4. Intelligent systems of online monitoring of the activity and selectivity of the catalyst for the process of dehydrogenation of hydrocarbons in the fluidized bed, aimed at maximizing the yield of the desired product, taking into account the degradation of the catalyst over time.
5. Highly efficient systems for cleaning internal devices of reactors from coke structures, products of steel degradation during the conversion of hydrocarbons in the fluidized bed (inside/without removal of shields/lattices from the reactor, with the possibility of defect monitoring).
6. Technical solutions for increasing the cooling capacity of air-cooling units in summer (except for the installation of water irrigation systems aimed at humidifying heat exchange surfaces and increasing the heat dissipation factor by no more than 50 %). This approach should provide a heat transfer coefficient of at least  $1000 \text{ W}/(\text{m}^2 \cdot ^\circ\text{C})$  for cooling systems of compressed hydrocarbon gas by air.
7. Alternative high-efficiency technologies for cleaning APG (associated petroleum gas) from  $\text{H}_2\text{S}$ ,  $\text{CO}_2$ , mercaptans, COS,  $\text{H}_2\text{O}$  (not related to sorption methods), allowing to achieve a residual content of sulfur-containing compounds not more than 0.01 %w/w, of  $\text{CO}_2$  no more than 0.03 %v/v.
8. Technology of low-potential heat recovery (with a temperature below  $150 ^\circ\text{C}$ ) with increased efficiency, including conversion to electricity and cold (excluding absorption refrigerators).
9. Innovative technologies for increasing the recovery of  $\text{C}_{3+}$  hydrocarbons from APG with an efficiency of at least 99.5 % (excluding STC and supersonic separation).
10. Technology of hardening of metal knives and sleeves of extruder nozzles used in the production of polymer products (elastomers, polyolefins, polyesters of terephthalic acid, expandable polystyrene) - with an increase in the lifetime of the components no less than 1 year.
11. Alternative (different from steam-ejector systems, water-ring pumps) vacuum technologies (allowing to work in wide ranges of productivity). Technologies that increase the productivity (or the depth of vacuum) of traditional vacuum systems.
12. Technologies that reduce the consumption of fuel gas in pyrolysis furnaces not older than SRT-2, not less than 10 %, provided that there is a standard thermal insulation.
13. Technologies for reducing coke formation in coils of pyrolysis furnaces (with the exception of sulfur-containing inhibitors).
14. Membrane or other energy-efficient technologies for separating closely-boiling molecules and molecules of similar dimensions (for example, separation of ethane/ethylene, propane/propylene, isobutane/isobutylene, butane/butylene/divinyl mixtures) with CAPEX and OPEX are not higher than conventional technologies atmospheric/extractive rectification). The monomer product must have polymerizable purity. With a specific energy consumption rate no more than using the traditional rectification method of a similar alkane/alkene fraction.
15. Alternative low-tonnage technologies for the production of ethylene (alternative to pyrolysis, but excluding oxidative dehydrogenation of ethane, and dehydration of ethanol).
16. New types of heat and cold insulation with coefficients of thermal conductivity of no more than  $0.021 \text{ W}/(\text{m} \cdot ^\circ\text{C})$  are more effective (in comparison with traditional ones: mineral wool, polyurethanes, foam glass, aerogel).
17. Systems of unpopulated/automated non-destructive testing of wall thickness and welded joints of apparatuses/pipelines that allow performing measurements without removing thermal insulation.
18. Methods of regenerating zeolite-dehydrators not associated with hot nitrogen purging (without loss of quality characteristics of the adsorbent and/or having less energy consumption by at least 20 %).
19. Highly efficient technologies for extraction of  $\text{C}_{3+}$  from dry stripped gas with minimal capital costs.
20. Innovative technologies for obtaining electricity from natural gas, with an efficiency of at least 0.9.