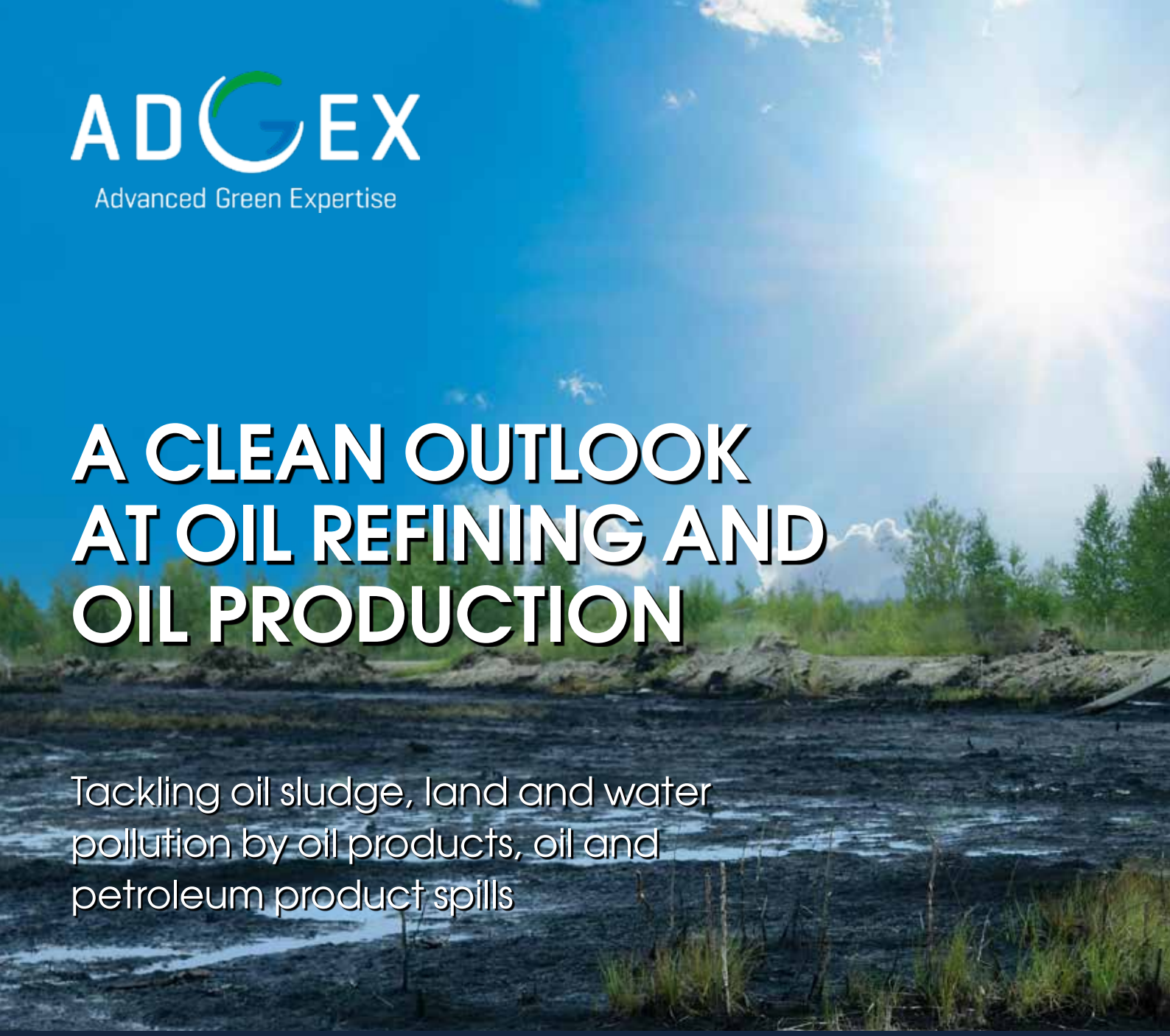
ADGEX
Advanced Green Expertise



A CLEAN OUTLOOK AT OIL REFINING AND OIL PRODUCTION

Tackling oil sludge, land and water pollution by oil products, oil and petroleum product spills

COMPETITIVE ADVANTAGES MOBILE COMPLEX *greenBLAZE*

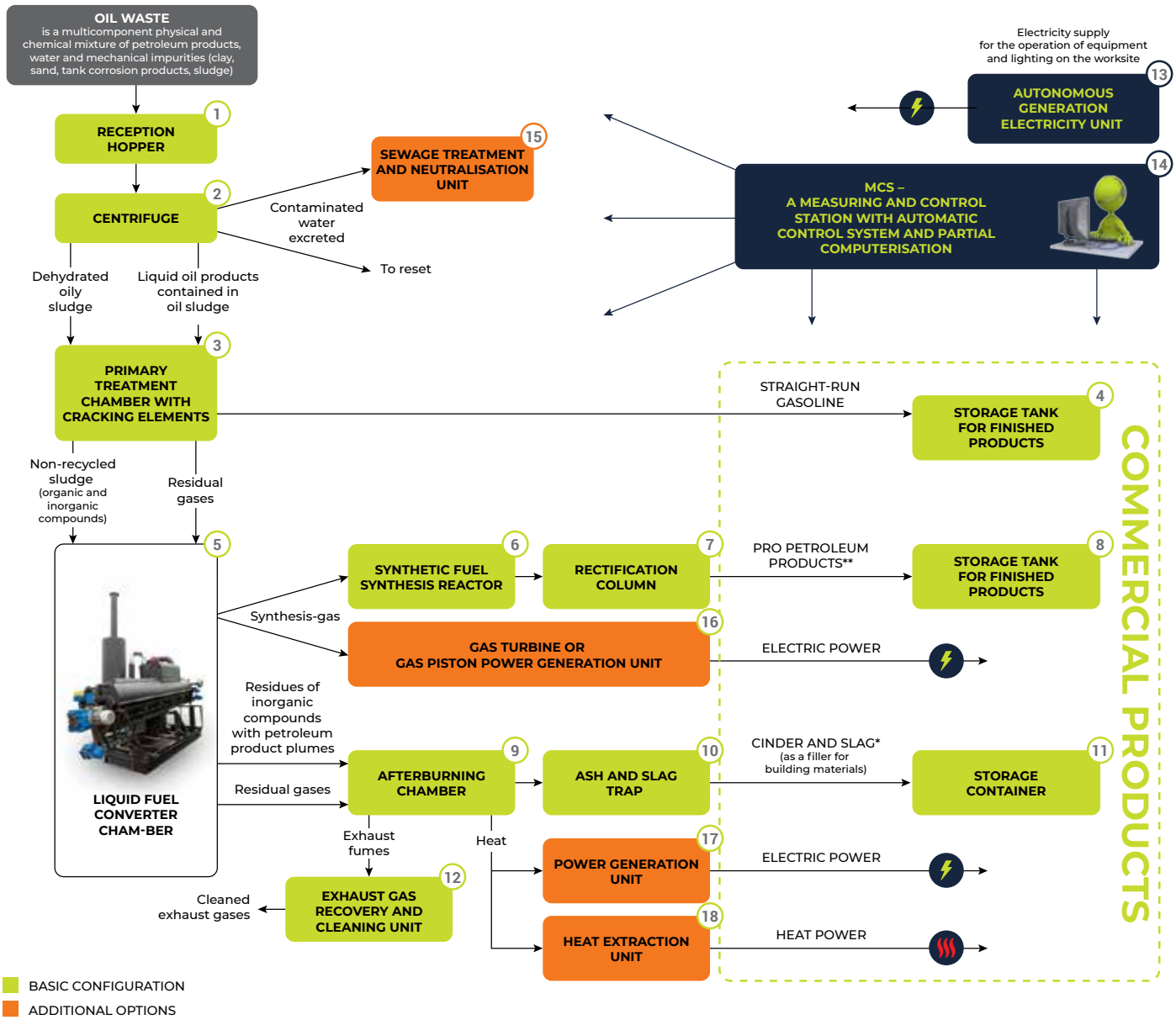
- A complete solution for the disposal and recycling of virtually any oil sludge composition.
- Up to 96% carbon mass frac-tion depth of oil sludge.
- Removal of inorganic compounds (earth, sand, metal oxides, etc.) from oil sludge.
- Mobility – the equipment is placed in containers and can be delivered to any place without infrastructure.
- Autonomy and energy independence – providing the Complex with energy supply during the work.
- Modularity – ability to complete the complex with auxiliary units (additional options – power generation, heat removal, etc.).
- Scalability – increase and decrease of oil sludge processing volumes at the expense of additional basic equipment complexes.

greenBLAZE | DISPOSAL AND RECYCLING OF OIL SLUDGE OF ANY COMPLEXITY

The mobile greenBLAZE Complex is designed for the disposal and recycling of all types of oil sludge from the oil production and refining industries, regardless of the complexity of their chemical composition and the amount of formation water they contain.

- Guaranteed performance in any geographical location without any infrastructure.
- High efficiency due to low operating costs and equipment reliability.
- The output products from oil sludge treatment are purified water and energy carriers.
- Environmental remediation and elimination of accumulated environmental damage.

WORKFLOW BLOCK DIAGRAM



* **Slag** – clay, sand, soil and other inorganic substances present in the oil sludge.
** **Pro petroleum products** – commercial petroleum products obtained in the process of rectification.

TECHNICAL SOLUTION DESCRIPTION

Delivery of oil sludge to the **Reception Hopper (1)** of the Complex is within the Customer's area of responsibility. The receiving hopper is used to receive oil sludge and to create a stock of raw material to ecsure uninterrupted operation of the Complex within 3 hours.

The reclaim of oil-containing elements (oil, fuel oil, etc.) is up to 70% of their content in the initial oil sludge. This result is achieved by using a **Centrifuge (2)** with variable chamber geometry, which reduces the energy consumption of the Complex and increases its productivity per tonne of weight.

The separated water from centrifugation can be discharged back into the environment or, at the customer's request, sent to the **Sewage Treatment and Neutralisation Unit (15)**, where it is removed and treated to any level, including discharge into a fishery pond.

The dewatered oily sludge after the centrifuge enters the **Primary Treatment Chamber with Cracking Elements (3)**. In this chamber, the sludge is heated and partially cracked, releasing straight-run gasoline.

The unprocessed sludge in the primary treatment chamber (organic and non-organic compounds) enters the **Liquid Fuel Converter Chamber (5)**, where under a dosed oxygen supply full deep oxidation and decomposition of oil products takes place, resulting in the output of synthesis gas.

The synthesis gas is then sent to the **Synthetic Fuel Synthesis Reactor (6)** to synthesise hydrocarbons. The gas fraction obtained in the reactor is sent to the **Rectification Column (7)**. The liquid pro-oil products obtained in the rectification column are diverted to the **Storage Tank (8)**.

The remains of inorganic compounds with a plume of undecomposed oil products go to the **Afterburner Chamber (9)**, where the final removal of oil products from sludge is done by burning organics with the emission of heat.

The ash and slag, which has undergone final cleaning in the post-combustion chamber, and the ash cut off after the decomposition of petroleum products, flow through the **Ash and Slag Diverter (10)** to the **Storage Container (11)**. The ash and slag are chemically inert and environmentally friendly, and can be used without further treatment as a filler for building materials.

The exhaust gases generated in the afterburner are fed to the **Exhaust Gas Recovery and Cleaning Unit (12)**. In terms of pollutant emission limits, the Complex meets the regulatory requirements of the European Euro-5 standard and the Russian GOST RF 305-2013.

At all stages of oil-slime transportation (transfer) from the unit to the unit in the prescribed manner is carried out by sealed transportation devices of closed screw and conveyor type.

In order to provide the Complex with autonomous power supply, the Complex is equipped with an **Autonomous Generation Electricity Unit (13)**.

To monitor and control the complex, the following is used **MCS (14)**.

ADDITIONAL OPTIONS

The heat released in the afterburning chamber can then be used as thermal energy as a commercial product and as a source of electrical power generation.

The heat is delivered to the **Electricity Generation Unit (17)**, which is a hydro-turbine, a closed loop water column with a tower height of 36 metres. The water from the tower falls onto the impeller of the hydro turbine, which drives 4 alternators with a rated capacity of 250 kW each. Having completed its work, the water is flung back to the top of the tower by an airlift effect, where it is temporarily stored in a storage tank and discharged again to the water turbine.

Residual heat, which is not fully utilised in electricity generation, is dissipated via the heat exchanger of the **Heat Extraction Unit (18)** and discharged to the atmosphere. In the future it may be possible for the customer to use the heat for commercial purposes (e.g. for ice and cold production - a proposal that can be considered as part of a separate project).

As an additional option, the **Synthesis Reactor (6)** and the **Rectification Column (7)** can be replaced by a **Gas Turbine or Gas Piston Power Generation Unit (16)**.

TACTICAL AND TECHNICAL CHARACTERISTICS (TTC) OF THE BASIC COMPLEX

Volume of oil sludge recycling:
- Up to 2 tonnes per hour

Oil sludge treatment depth:
- Up to 96% carbon by mass fraction

Output commercial products:
- Straight gasoline
- Pro Petroleum Products
- Cinder and slag, as construction materials

Mobility of the Complex and its deployment:
- All equipment of the Complex is placed on the base of 3 20-foot containers
- Complex deployment time: 12 hour
- The cassette-module approach allows increasing the volume of oil sludge processing by attaching additional Complexes (modules), and also quickly and easily relocate the complex (complexes) to a new location

Harmful emissions and discharges:
- Minimized, within the allowable MPC

Energy consumption of the Complex:
- no more than 30 kWh

Service personnel per shift:
- Operator engineer – 1 employee
- Apparatus engineer – 1 employee

Mode of operation of the Complex:
(at Customer's option)
- Continuous: 24/7/365
- Intermittent: up to 8500 motor-hours per year

The warranty for the Complex greenBLAZE:
- 36 months. – subject to annual service
- 12 months. – if the Customer carries out the service himself

Service maintenance of greenBLAZE Complex:
- Once a year (duration of service 14÷20 days)
- Cost of service maintenance is 5% of the cost of the Complex

Climatic conditions of the Complex:
- -50°C ÷ +60°C

Service life of the greenBLAZE Complex:
- Up to 15 years - subject to annual service maintenance

INFORMATION FOR CUSTOMERS

Final cost of greenBLAZE Complex:
- Depends on the customer's requirements, specification of oil sludge and volume of its processing, additional options and output commercial products after processing
- It is possible to change the specifications according to the Customer's request

Price of the greenBLAZE Complex includes:
- Customer's personnel training (held during pre-commissioning);
- Installation & Commissioning

Manufacturing time:
- 4 - 7 months (depending on configuration of the greenBLAZE Complex)

We are always in touch

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