

## Investment program 2020

2019 Investment program is structured in 3 sections, based on objectives and projects magnitude. Total investments value for 2020 is **124,318,895 USD**, according below table:

	<b>Budget 2020</b>
<b>Petromidia, from which:</b>	<b>114,441,960</b>
Development	9,098,157
Operational Support	4,341,665
Compliance	25,573,178
Capital maintenance	75,428,960
<b>Vega, from which:</b>	<b>9,876,935</b>
Compliance	5,294,737
Capital maintenance	4,582,198
<b>Refinery Total Investments</b>	<b>124,318,895</b>

### **Development**

This category includes projects whose implementation leads to a change in the technological process, resulting an increase of production capacity compared to the current status.

From this category, a very important projects is place is held by projects from „Storage and logistics” area, which, consecutive to processing capacity of the refinery increasing to 5mil.tones/year after „2010 Package” implementation, will solve refinery problems regarding storage possibilities, blending and deliveries of the products in order to get a maximum efficiency by a rational use of all components. Projects from this category:

#### **❖ 100C1 atmospheric distillation column**

The 100C1 atmospheric distillation column in the Crude Distillation Unit is one of the most important columns in the refinery. Project main benefits consist in assuring a good white product yield recovery in the crude unit, increasing the Ural flow rate to keep MHC at maximum capacity and minimize the risk of corrosion on the top of the column.

Project will be implemented during Refinery General turnaround 2020.

#### **❖ Maximize usage of 185 unit condensate thermal potential**

The project main objective consist in increasing Refinery Energy efficiency by:

- reducing EII with 0.29 points,
- by maximizing usage of condensate from amine unit.

#### **❖ Improve 180C2 Coker fractionator operation by installing Light Coker GasOil pumparound**

- Installing of a new LGO (Light gasoil) PA in DCU 180C2 fractionator will optimize the temperature profile on the column. This will result in additional LCGO (light coker gasoil - diesel component) recovery at the same quality by reducing the HCGO (heavy coker gasoil-feed to MHC) draw.

- MHC unit will be unloaded, and supplementary crude can be processed to back-fill the MHC and improve economics;
- Project will be implemented during Refinery General turnaround 2020.

## **Compliance**

This category includes compulsory investments required by environmental and safety regulations:

### **❖ Expire authorization ISCIR for static equipment (ISCIR 2019-2020)**

Project consists in aligning to legislation requirements in terms of safety functionality of the refinery equipment.

In July 2010 occurred new modifications of the existing legislation, namely technical prescriptions C4, C6 and C10, 2010 edition introduced the obligation to prepare Examination, Checks and Investigation (EVI) Programs for all equipment and pressurized pipes older than 12÷18 years in order to perform Technical Checks in Use for Examinations with Technical Character (VTU-IECT).

As of 2004 the Beneficiary was required to prepare Technical Documentation for each pipe and to authorize all pressurized pipes owned. By project implementation, the following benefits are expected:

- Running with the refinery units in safety conditions according to legislation in force, as a result of detailed verifications which will be performed during this evaluation program which will have as a result the technical evaluation of the equipment after specified years of service, as well as repair or elimination of the faults which will appear after the checks;
- Obtaining the functioning authorization for the pressurized equipment, pipes and lifting equipment as per Technical Prescriptions

The project main objective consist in running with the refinery units in safety conditions according to legislation in force, as a result of detailed verifications which will be performed during this evaluation program which will have as a result the technical evaluation of the equipment after N years of service, as well as repair or elimination of the faults which will appear after the checks.

### **❖ Fire-fighting Water Main Replacement Package 2020 sections T009, T010, T013, T049, T050, T051**

- Increase the safety level for personnel and assets.
- Increase the level of prevention and protection in case of emergency situations (fire) by providing the necessary operating conditions for firefighting system: 12barg in standby mode and 16barg in case of fire.

### **❖ Mount floating membrane on tanks T7, T8, A64, A65, Vega Platform**

- Decrease the emissions of volatile organic compounds into the atmosphere, as per the requirements of EU Decision 9/10/2014 BAT by decreasing with 70% the evaporation losses following the installation of internal floating roofs.
- Also, by mounting internal floating roof will avoid the risk of air pollution by emissions of VOCs and reduce the risk of receiving penalties from the competent institutions in environmental protection.
- Reduced risk of fines from the ISU Seveso Directive (Inspectorate for Emergency Situations) due to hydrocarbon emissions in the atmosphere that can lead to explosive mixture, or even fire in the tank farm

## **Capital Maintenance**

❖ **Rehabilitation tank C100 and connection to delivery paths**

- Ensuring the needed facilities for safe operation of the C100 tank from technological and safety point-of-view
- Running with Diesel In Line Blending Unit through automation and use in a proper operational way diesel component from HPM, HPR, HDV and MHC units
- Increase storage capacity for diesel component and finished product in order to ensure operational and logistic flexibility and to operate the refinery at a processing capacity of 5 mil tons / year.

❖ **Reconstruction tank T103 and upgrade new firefighting system facilities and infrastructure**

- To have the tank fully operational from technological and safety point-of-view by ensuring the needed facilities for proper storage.
- Repair T103 tank and observing the legislation in force (893/2005 HG) concerning the limitation of volatile compounds.
- Reduce gasoline losses through evaporation.
- Alignment to the requirements imposed by legislation (GD 893/2005 and GD 568/2001) on environmental protection (reduction of emissions of volatile organic compounds). Failure to comply with the requirements of GD 893 may lead to withdrawal of the Refinery operating permit if the requirement is broken repeatedly. Refinery authorization shall be valid again only until the facility is implemented.
- Ensure necessary flexibility for storing different grades of gasoline. Currently there is a high number of gasoline grades stored in a low number of tanks which may cause delivery giveaways.

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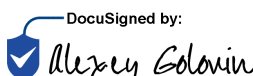
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**PLAN CAPEX 2020 BU REFINING**

Nr. crt.	Project Name	Total Project estimated Budget	2020 Budget
	<b>Refining</b>	\$ 218,875,022	\$ 124,318,895
	<b>Petromidia</b>	\$ 179,279,551	\$ 98,588,765
	<b>Petromidia Development</b>	\$ 43,544,613	\$ 6,338,300
1	100C1 Atmospheric distillation column- increase heat removal from gasoil pumparound	\$ 3,142,306	\$ 1,479,732
2	Improve 180C2 Coker fractionator operation by installing Light Coker GasOil pumparound	\$ 2,169,031	\$ 1,416,859
3	Maximize usage of 185 unit condensate thermal potential	\$ 1,074,645	\$ 507,612
4	New HP pipelines 36 barg between Ref UTM limit-node A and RPP node H	\$ 1,298,153	\$ 112,200
5	Implement dewaxing project in U125-DHT	\$ 35,860,478	\$ 2,821,897
	<b>Petromidia Operational</b>	\$ 130,317,678	\$ 90,480,605
	<b>Petromidia Operational - Operational Suport</b>	\$ 8,786,465	\$ 4,341,665
6	Increased capacity of storing gasoline RC in 343 objectives through reconfiguration of the Park and facilities pumping	\$ 4,270,939	\$ 3,424,712
7	Mild Hydrocracking Unit Revamp	\$ 4,515,526	\$ 916,953
	<b>Petromidia Operational - Compliance</b>	\$ 28,122,305	\$ 21,643,139
8	Detailed Design Engineering For Fire-Fighting System Rehabilitation	\$ 987,371	\$ 11,000
9	Fire-fighting Water Main Replacement 2020	\$ 1,377,910	\$ 1,100,000
10	Expire authorization ISCIR for static equipment's (ISCIR PEM 2019-2020 )	\$ 24,795,243	\$ 20,111,984
11	Install online wastewater parameters monitoring system	\$ 438,195	\$ 35,829
12	Replace discharge pipe at Carasu Pumping Station	\$ 523,586	\$ 384,326
	<b>Petromidia Operational - Capital maintenance</b>	\$ 93,408,908	\$ 64,495,802
13	Refinery 2020 General Turnaround	\$ 34,691,155	\$ 32,491,007
14	Rehabilitation of compressors 352 K111, K511, HPP Unit	\$ 1,397,731	\$ 854
15	Emergency works for unexpected capital maintenance 2019	\$ 252,523	\$ 74,589
16	Replacement of VRU system at IPPA and CF Ramp	\$ 1,719,034	\$ 494,346
17	Replacement of tubular bundles for 122S3C and 122S100 heat exchangers	\$ 173,493	\$ 53,900
18	Replace caustic tank 138-Me-V14	\$ 120,215	\$ 57,549
19	Crude oil pipeline rehabilitation between 50.000 storage tanks and DAV plant	\$ 939,251	\$ 153,351
20	Replacement of reactor 130R1R2R3	\$ 3,424,515	\$ 1,216,113
21	Repair work on tanks TL70, V26/1B and V27	\$ 660,503	\$ 327,007
22	Replace old 6 KV swithces and releys compartiments in power station SRA2-4, 301 Nitrogen Plant	\$ 1,525,790	\$ 356,688
23	Installing a low pressure steam reboiler instead of the current means of bringing heat to the stripping column	\$ 176,638	\$ 59,730
24	Replacement of pumps P121-P6A,R (HPR) and pumps P122-P5A,R (HPM) with two new pumps serving both plants/ pumps P 121-P1A,R -HPR	\$ 1,104,533	\$ 345,950
25	Rehabilitation of C100 tank and connection to delivery paths	\$ 3,307,649	\$ 159,947
26	Optimization of NSRU operation	\$ 369,188	\$ 243,324
27	Reconstruction tank T103 and upgrade new firefighting system facilities and infrastructure	\$ 1,071,096	\$ 838,812
28	Purchase shells of heat exchangers 180S5, 180E100, 180E101, 180E102 and tubes bundle of heat echanger 180S4A, DCU Unit	\$ 450,048	\$ 230,326
29	Improvement LPG recipes and transfer between spheres, loading ramp, Berth 9A	\$ 368,269	\$ 628,619
30	FCC Unit Rehabilitation	\$ 7,368,124	\$ 6,216,937
31	Tank DH25 rehabilitation	\$ 2,475,825	\$ 55,000
32	Refinery 2020 Catalyst Change	\$ 15,032,532	\$ 15,030,000
33	Execution tubular section for 138GE21/6, FCC unit	\$ 107,711	\$ 89,963
34	Replacement air preheater of 180H1 furnace, DCU Unit	\$ 399,829	\$ 352,014
35	Replace Tube Bundle RF 250/I-Azot-Oxigen plant	\$ 93,316	\$ 78,390
36	Replace the electrical distribution equipment in the 107 Coke and 109 AFPE stations	\$ 1,279,118	\$ 527,487
37	Preparing to 2024 general repair and 2020 partial repairs on H201 elements, HPP Unit	\$ 2,673,178	\$ 2,635,798
38	Replace coke drilling-cutting system in the DCU unit	\$ 9,659,642	\$ 284,823
39	Replacement of 100S18, 100S24A, 100S8ABCD, 120S1CDH, 120S3A heat exchangers, 100A6 air cooler, Crude Unit and NHT Unit, Petromidia Platform	\$ 2,068,002	\$ 1,493,277
	<b>Petromidia Non-Operational</b>	\$ 5,417,260	\$ 1,769,859
	<b>Petromidia Non-Operational - IT</b>	\$ 5,055,872	\$ 1,528,179
40	APC in all Refinery units	\$ 4,229,772	\$ 1,067,679
41	Automation of evidence for pressure vessels, boilers, pressure pipes and lifting equipment	\$ 250,800	\$ 5,500
42	Artificial intelligence – Big data analysis	\$ 190,300	\$ 100,000
43	GDOT-Generic Dynamic Optimisation Technology	\$ 385,000	\$ 330,000
44	IT non-standard equipments 2020	\$ 25,000	\$ 25,000
	<b>Petromidia Non-Operational - ADMINISTRATIVE</b>	\$ 361,388	\$ 241,680
45	New ventilation system-for RQC	\$ 361,388	\$ 241,680
	<b>Petrochemicals</b>	\$ 24,797,784	\$ 15,853,196
	<b>Petrochemicals Operational</b>	\$ 24,797,784	\$ 15,853,196
	<b>Petrochemicals Operational - Compliance</b>	\$ 4,807,000	\$ 3,930,040
46	Mandatory renewal ISCIR Authorization for static equipment's Petrochemical Platform (ISCIR 2019-2020)	\$ 4,807,000	\$ 3,930,040
	<b>Petrochemicals Operational - Capital maintenance</b>	\$ 11,821,768	\$ 9,163,299

47	Rehabilitation of propylene tank F911	\$	4,162,084	\$	2,484,870
48	Increase capacity for D209 column by increasing the Propylene polymer grade flow with a booster pump	\$	242,088	\$	134,141
49	Petrochemicals 2020 General Turnaround	\$	6,720,782	\$	5,971,515
50	Replace heat exchange battery 324E405, PP Unit and heat exchanger 322E101, LDPE Unit	\$	256,710	\$	230,644
51	Replacement of tubular bundle Dn600 of E903 heat exchanger, Criogenic Unit and replacement of 32 tubular bundle at ECO640 heat exchanger, Brine Unit	\$	440,104	\$	342,129
<b>Petrochemicals Operational - Development</b>		\$	<b>8,169,016</b>	\$	<b>2,759,857</b>
52	Swing HDPE to PP	\$	8,169,016	\$	2,759,857
<b>VEGA</b>		\$	<b>14,797,687</b>	\$	<b>9,876,935</b>
<b>VEGA Operational</b>		\$	<b>14,797,687</b>	\$	<b>9,866,935</b>
<b>VEGA Operational - Compliance</b>		\$	<b>6,642,984</b>	\$	<b>5,294,737</b>
53	Mount floating membranes on hexane tank T7, T8, A64, A65, Vega Platform	\$	900,038	\$	31,142
54	Install mobile and adjustable bridge in unloading fuel oil ramp	\$	266,119	\$	38,000
55	Purchased incinerator in Bitumen unit	\$	3,701,904	\$	3,131,557
56	Mandatory renewal ISCIR Authorization for static equipment's Vega Refinery Platform (ISCIR	\$	1,554,923	\$	1,277,553
57	Mount floating membrane Priority 2 vega tanks	\$	220,000	\$	816,485
<b>VEGA Operational - Capital maintenance</b>		\$	<b>8,144,703</b>	\$	<b>4,572,198</b>
58	Replacement of the General Distribution Switchboards in Vega Refining electrical stations (PT2)	\$	425,691	\$	1,430
59	Replacement of the high pressure motor-compressor assemblies (Resita 1, Resita 2, Resita 3)	\$	384,458	\$	2,244
60	Vega Shutdown 2020	\$	2,930,278	\$	2,709,077
61	Replaced heater in VD unit	\$	4,087,476	\$	1,605,346
62	Purchase equipment 140-V1, 140-V2, 141V1, 140-NV5	\$	316,800	\$	254,100
<b>VEGA Non-Operational - IT</b>		\$	<b>10,000</b>	\$	<b>10,000</b>
63	VGA IT Non standard 2020	\$	10,000	\$	10,000

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