





# Hydrocarbon Exploration Plays & Potential within GOG blocks in Georgia

London March 4<sup>th</sup>, 2020



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### Main take away messages (General)



- GOG with their shareholders has more than 25 years combined experience of petroleum operations in Republic of Georgia with petroleum exploration license portfolio of 13,000 km².
- GOG's goal is to find up to 7 Tcf of gas and 200 MMbbl light oil/condensate around Samgori field (produced 200 MMbbl) in similar/deep SLAD plays (Samgori lookalike deep).
- GOG is looking to support development of geothermal energy projects within their license blocks.
- In case of success of 2020-2024 work program (WP) for SLAD Projects:
  - On example of first priority project Norio Deep (N) with following economic figures:
    - US\$ 2 billion NPV@10 with 96% IRR from developing 3.5 Tcf gas prospect in Middle Eocene reservoir (N),
    - US\$ 0.9 billion NPV@10 with 84% IRR from 100 MMbbl Oil prospect in Middle and Upper Eocene reservoirs (N).
  - Project participants (2020-21 WP) can generate 5+ times multiple on investment within up to 5 years.
  - Project will meet Georgia's hydrocarbon demand for next 25-30 years and provide supply for international market through existing network of pipelines.
  - Project will increase possibility of discovering similar size plays to Norio, in South of Samgori prospects (SS) and Kartli prospects (K).

### Main take away messages for WP for 2020-21



#### Scenario A:

- GOG is looking for raising US\$ 20m to perform 750 km of 2D Seismic/MT survey in 2020-21:
  - To combine WP results with ongoing interpretations of historic data (OIHD).
  - To create a combined land of licenses with prospective structures under similar commercial terms of PSA (2020).
    - To create the largest acreage for onshore exploration from Black to Caspian Sea (up to 15,000 km²)
  - To increase chance of success of SLAD prospects:
    - Norio Deep (N) up to 30% + with investing US\$ 7.5m
    - South Samgori Deep (SS) up to 25% with investing US\$ 8m
    - Kartli (K) area up to 20% with investing US\$ 4.5m
  - To prepare projects for farm-outs with major/mid size oil companies (2021-22).
  - To mature basin edge (Play II) and low permeable sandstone leads (Play III) within Kura Basin.

### Main take away messages for Norio Project WP (2020-21)



#### Scenario B: (minimum program)

- GOG is looking for raising US\$ 7.5m to perform 250km of 2D Seismic/MT survey in 2020-21:
  - To combine WP results with ongoing interpretations of historic data (OIHD).
  - To create a combined land of licenses with prospective structures under similar commercial terms of PSA (2020).
  - To increase chance of success of Norio Deep up to 30%+.
- Strategy for raising money for work program:
  - Existing debt financing agreement with State Oil Company (GOGC) on investment of US\$ 3.5m to earn contractual interest in XI<sup>M</sup> and XI<sup>N</sup> (Norio Project).
    - Conditional that GOG will deliver final technical report about Norio Deep to GOGC at the end of May of 2020 and state will finish auditing of report and express interest until end of October 2020.
  - US\$ 4m from future private investor. (+US\$ 2m for reducing GOGC's participation in loan financing preferable)
- To prepare project for farm out with major/mid sized companies for 105m program (2022-24) including:
  - Drilling 1 Well US\$ 35m 2022 (up to US\$ 10m contribution from 2020-21 program investors preferable).
  - 3D Seismic US\$ 15m 2023.
  - Drilling 2 Wells US\$ 55m 2024.



### **Country and Company Overview**

### Georgia General





2019 (88 BCF)



Population of Georgia - 3.7 million

Total area – 70,000 km<sup>2</sup>

GAS CONSUMPTION BY SECTOR 2019 (BCF)



The EU and Georgia signed an Association Agreement (AA) on 27 June 2014, and it has entered into force since 1 July 2016.

Forecasted annual Gas consumption by 2026 - 129 BCF

Forecasted daily Oil consumption by 2026 - 12,000 bbl

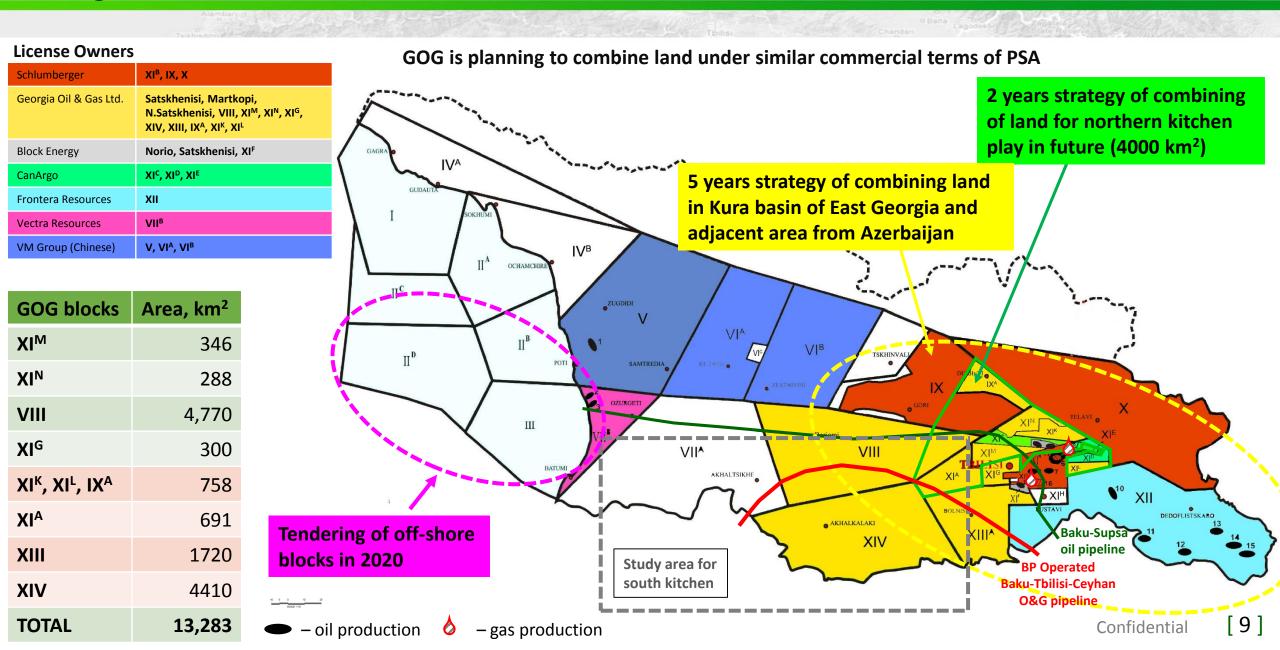


For the past 25 years of operation history of GOG there was no case of legal dispute with State officials.

PSA Partners from State, State Agency of Oil and Gas (SAOG) and Georgian Oil and Gas Corporation (GOGC) were supporting GOG's operations with providing loans and extending timing for minimum work programs.

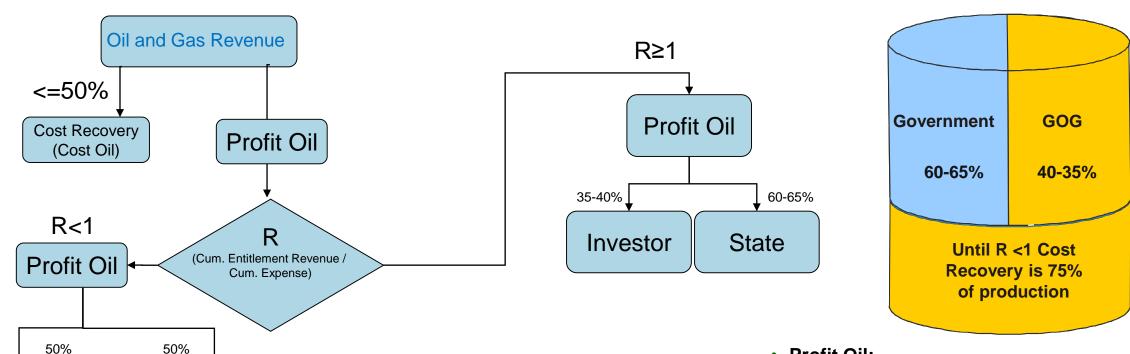
### GOG owns over 13,000 km<sup>2</sup> of HC exploration acreages in Central-Eastern Georgia





#### **PSA Commercial Terms chart**





Commercial Discovery bonus – 1 – 5m US\$

State

State Back in Option – 20-25%

Investor

Regulation fee – 2 US\$ per bbl

- Profit Oil:
  - For VIII & XI<sup>G</sup> Block's R≥1 35%
  - For Martkopi, XI<sup>M</sup> & XI<sup>N</sup> Block R≥1 40%
  - New Licenses (IX<sup>A</sup>, XI<sup>K</sup>, XI<sup>L</sup>, XIII, XIV) 40%
- Duration of licenses 25 years +5 years extension (for production period)

Note: As per PSA terms –Investors Profit tax and mineral usage tax liability is assumed and paid by the State out from the State share of Profit Oil. The state share of Profit Oil includes all taxes, levies and duties to be payable by the Contractor.

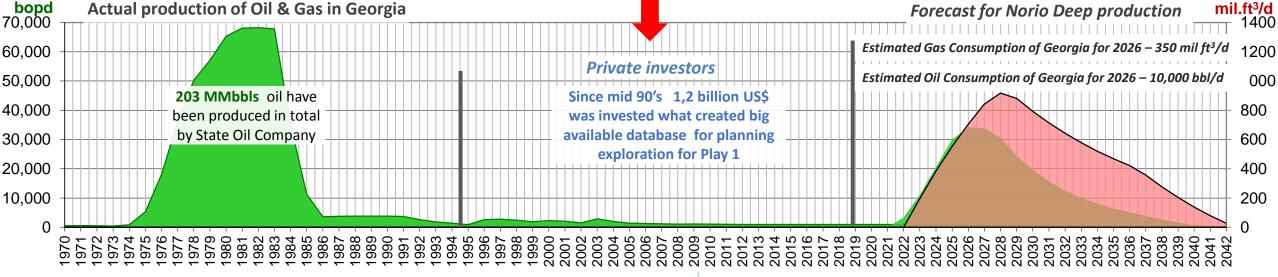
Confidential [10]

### History of Oil & Gas Industry of Georgia and future exploration solutions



#### Solutions for success are:

- to combine State and private sector efforts for exploration work programs and attracting interest of industry majors (4,500-7,000 m deep exploration Play 1) for SLAD projects
- To combine small license acreages in bigger acreages with similar contractual terms.
- to reinterpret historically created data and use ongoing shallow production projects (Play 2) for proving concept for exploration of Play 1



### State Oil company "Georgian Oil" (license owner for all Georgia)

- Georgian Oil did not own the oil; it was funded for capital programs (mainly drilling) from the Ministry of Oil and Gas of Soviet Union; which declined after 1986
- 15 commercial and non-commercial oil fields were identified in Georgia and 95% of production relates to Middle Eocene fractured reservoir of Samgori fields (Patardzeuli, South Dome, Ninotsminda, Teleti)

#### Private investors

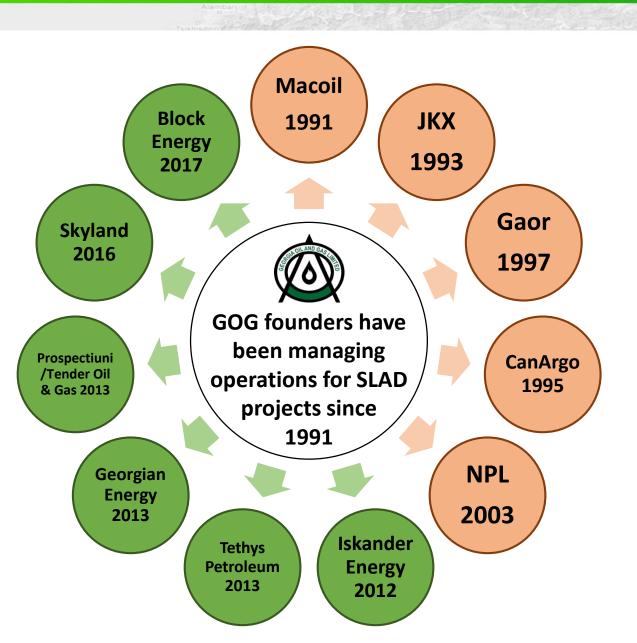
Year

(dividing Georgia into big number of small license blocks)

- Within tens of investors through the last 20 years period only two of them had background of being E&P companies
- Oil companies were mainly focused on increasing production from existing fields
- Exploration for gas was very limited in Georgia due to marketing challenges until 2005

### Since 1991 GOG's founders had a history of commercial and discovery success in SLAD projects





- GOG Ltd. is a BVI registered company created in 2010
- GOG acquired first licenses in April 2011 (Norio, Satskhenisi, Martkopi) from its shareholder company NOC (Norio Oil Company)
- Norio Oil Company itself was created by GBOSC which was the operating and contractor company for number of projects before 2005
- GBOSC was since 1994 drilling services provider for tens of wells throughout East Georgia and reinvested money from services in project like Norio, Manavi (noncommercial discovery), Ninotsminda, Samgori and etc.

Ninotsminda Middle Eocene production project (analogy to SLAD Projects within GOG blocks) was only commercial project with applying directional drilling technology by GOG founders.

### GOG's Team and Management (having 30 years work experience in SLAD projects)

Ms Mariam Bedoshvili

**Dr Mehmet Arif Yukler** 

University.



Mr Niko Tevzadze MSc	Over 30 years of technical, operational and senior management experience throughout Georgia, Russia, Kazakhstan, Tajikistan.
Chairman & President	(1986 – 1990) Georgian Oil (state owned company) - Chief of Operations, (1991 – 1993) Georgia British Oil (Operating Company),
	JKX Oil & Gas Plc, (1996 – 2005), CanArgo Energy Corp - Chief of Operations.
	Founder of number of companies: GBOC, NOC and GOG.
Mr Vakhtang Sakvarelidze	Over 30 years experience in Georgia with a wide range of upstream oil companies. Previous positions include, CFO at Georgian

**Director, CFO** Oil, CFO CanArgo Georgia and now CFO at Georgia Oil and Gas Limited.

Over 25 years of Corporate Governance and organizational experience in the Georgian Oil and Gas Industry.

**Director** Mr Mikheil Dalakishvili Over 10 years experience in oil and gas industry in Georgia, Mikheil is an Georgia Oil and Gas Georgia Branch Director since 2012. **Country Representative** From 2013 to 2016 was also an executive at the Georgian Association of Petroleum Companies. In addition, Mikheil has an MBA from the Central European University and a BA in Business Administration and General Management from the Caucasus

Mr Alexander Janiashvili Over 12 years experience within oil and gas. Has held a number of senior technical positions within Russia and Georgia and is MSc highly experienced in the fields of geological modelling, estimation of reserves, petrophysical modelling and reservoir evaluation. **Chief Geologist** 

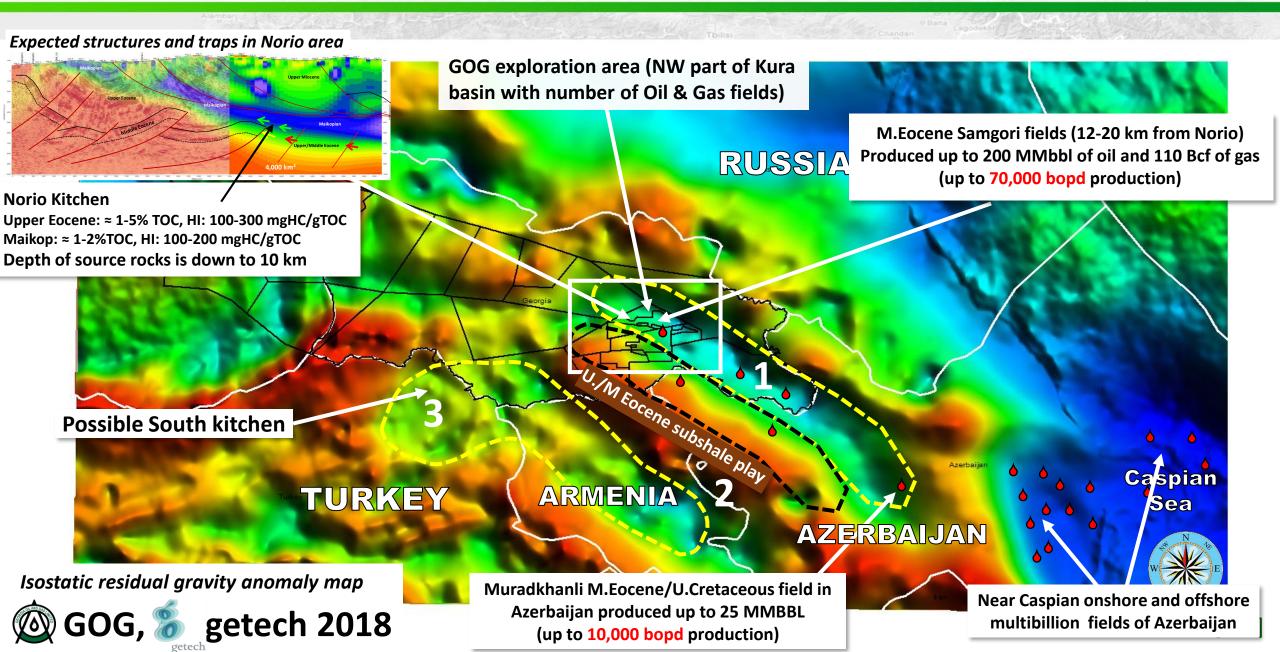
Over 40 years experience in the international oil & gas industry, and has advised companies and government entities of all size from small caps to super-majors, as well as state regulatory authorities on the management of resources and exploration areas. **Chief Advisor for Exploration** Has worked in and studied all the known hydrocarbon bearing basins of the world. Dr. Yukler has been involved in petroleum operations in more than 35 countries. Credited with more than 80 oil and gas finds.

**Mr Claudio Buhler** Mr. Claudio is a director of his own fiduciary company and advisor in finance, investment and investment management to a number of oil and gas companies, including as non-executive director on the Georgia Oil and Gas board. **Non-Executive Director** 

**Mr Alberto Martinez** With over 27 years experience in the financial and fiduciary industry Alberto is a director and advisor of Georgia Oil and Gas Board **Non-Executive Director** since 2016. [ 13 ] Confidential

GOG's goals are to find up to 7 Tcf of gas and up to 200 MMbbl oil fields in prolific NW part of Kura basin (1) and to perform exploration/study for possible U./M.Eocene shallow play (2) and south kitchen (3)



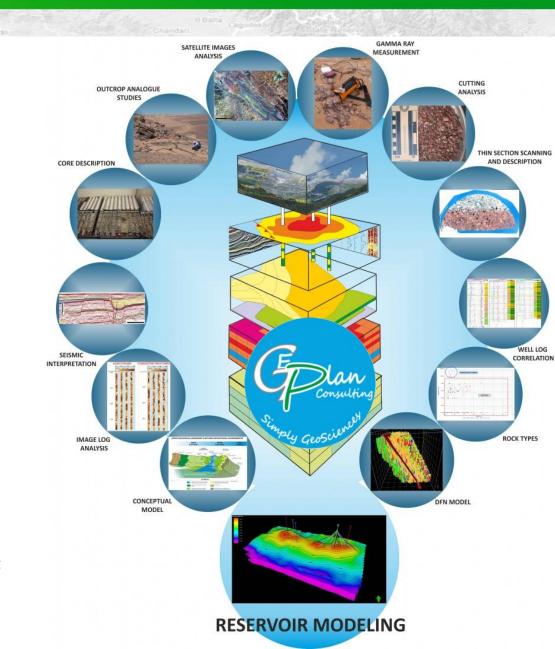


### GOG works with the best in their area contractors for ongoing interpretations of historic data (OIHD) since 2017



#### **Contractors involved in GOG exploration projects**

- GEPlan Consulting Petroleum Geosciences (Italy)
  - Combined interpretation of Seismic, MT and Gravity data
  - Resource estimation, static reservoir model creation
- PanTerra Geoconsultants B.V. (Netherlands)
  - Consultancy for geothermal projects
- I. Javakhishvili State University Institute of Geophysics (Georgia)
  - Supervision of projects
- Geochemical department of Leoben University (Austria)
  - Geochemical analyses of oil, gas and rock samples
- GK Processing (Poland)
  - Seismic lines combined reprocessing
- GeoPartner (Poland)
  - MT acquisition, processing and interpretation
- Complete MT Solutions (Canada)
  - MT data reprocessing and analysis
- Getech (UK)
  - Regional gravity, magnetic, LANDSAT satellite mapping (south kitchen study), basement mapping
- EPI Group (UK) (Quality Control by OMV Petrom)
  - Reprocessing and interpretation of 2D and 3D seismic, Reservoir engineering, Well designs

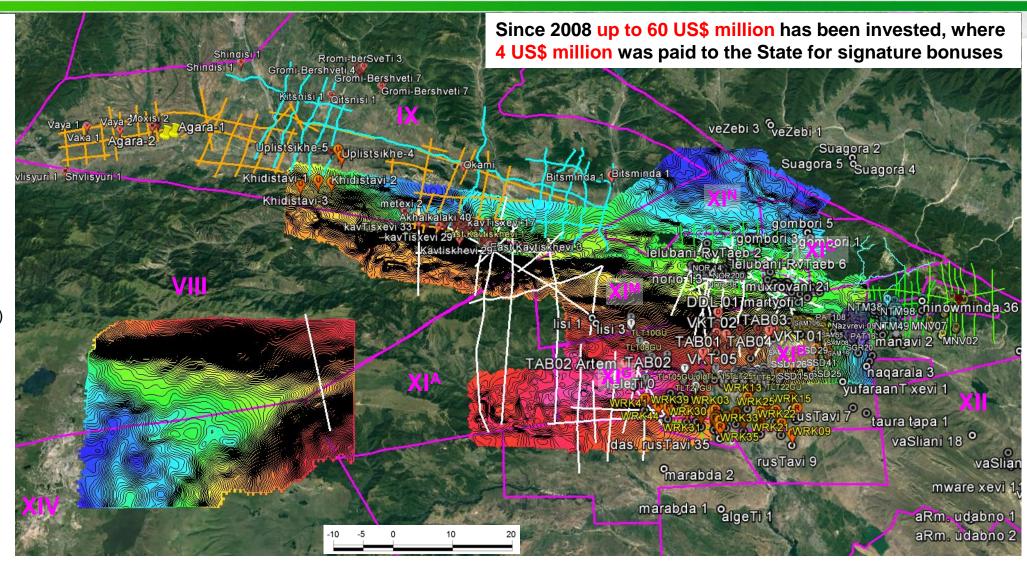


### GOG's Exploration Program & Work Completed since 2008



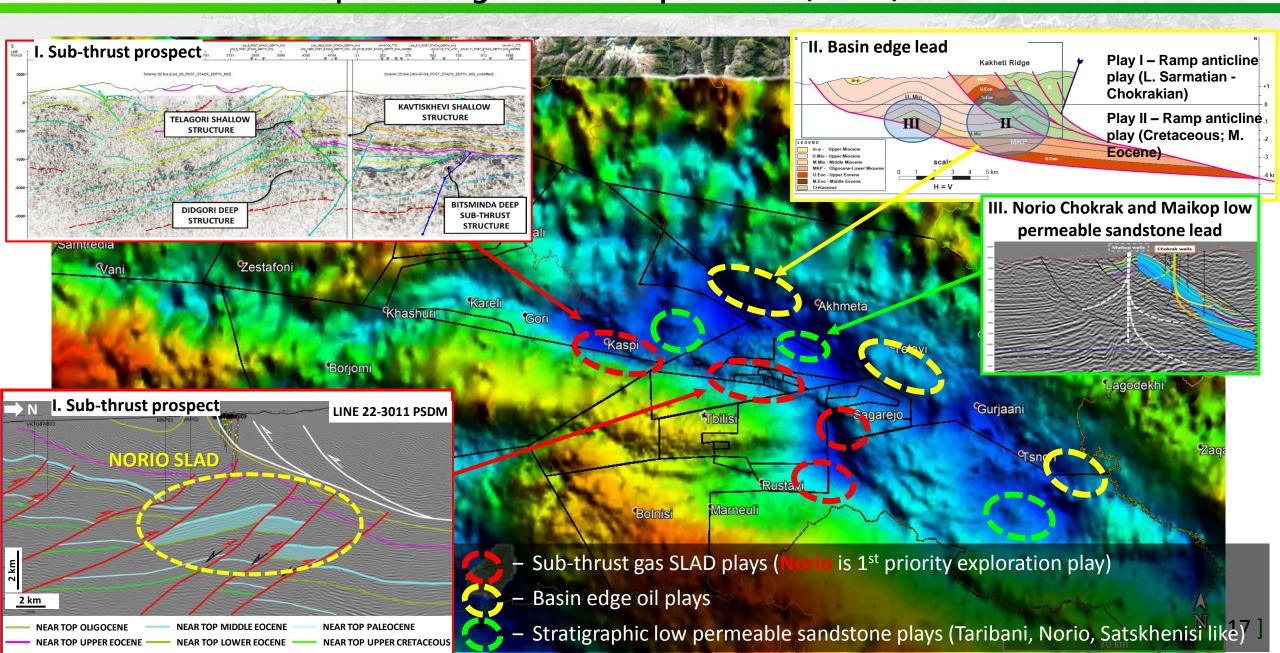
# Since 2008 GOG has already carried out the following exploration programs in its blocks:

- 655 km 2D seismic survey
- Combining of 4000 km 2D seismic data
- 3,300 km<sup>2</sup> land gravity survey and integration with regional gravimetric data
- Creating Gravity and Magnetic Maps of Georgia
- Geochemical studies for Maikopian, Upper Eocene and Jurassic source rocks (ongoing)
- 1 exploration well drilled in Block XI<sup>G</sup>
- Number of workovers (at least 25 wells) (Norio & Satskhenisi fields)
- 2 wells with multistage frac drilled through Iskander Energy farm-out in Satskhenisi field
- · 2 wells drilled in Norio field
- Created drilling equipment infrastructure to reduce exploration costs
- 350 km MT survey
- 1 well Rustavi block XI<sup>F</sup> drilled through Block Energy farm-out



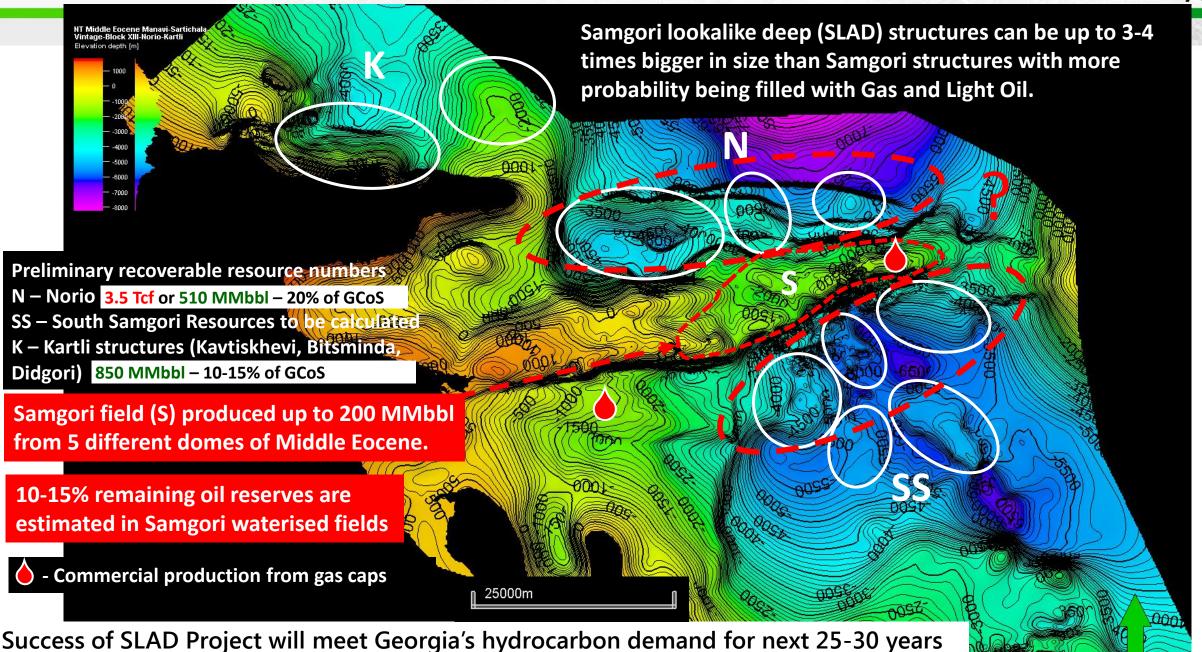
### Three types of exploration prospects/leads within HC Play I were identified as a result of combined re-processing and reinterpretation (OIHD)





#### Why 7 Tcf of Gas and 200 MMbbl Oil/Condensate in SLAD projects



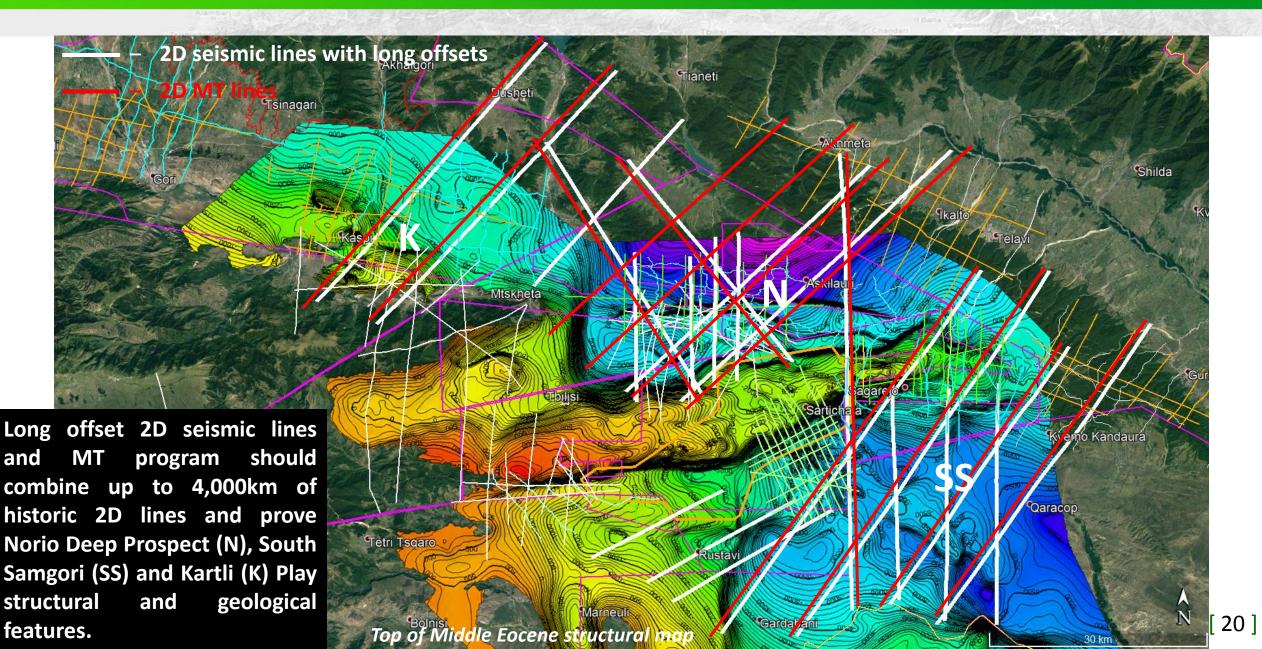




# US\$ 20m work program for 2020-2021

# 750 km 2D seismic work program for Norio Deep, South Samgori and Kartli area





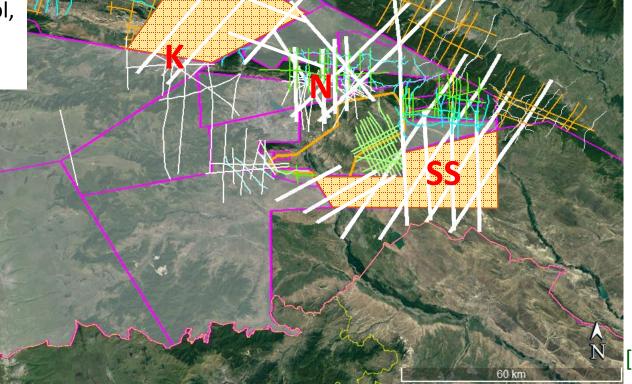
### Commercial purpose of Seismic/MT work program





- To create the largest acreage for onshore exploration from Black Sea to Caspian Sea
- To prepare structures for farm-outs with major/mid size oil companies (2021)

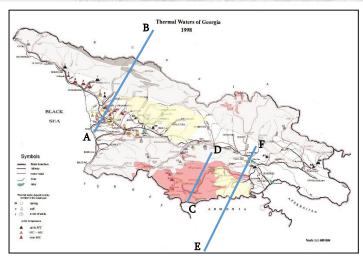
 Negotiations were going with OMV Petrom and Repsol, which will be continued in June-July 2020 after completing off-shore tender



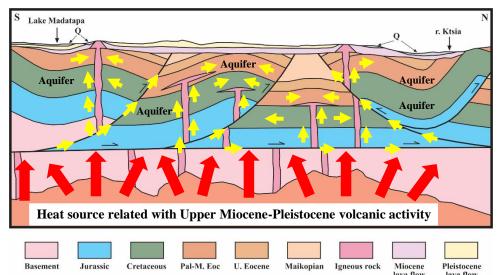
# GOG is planning to support development of geothermal energy projects with proved potential within their license blocks



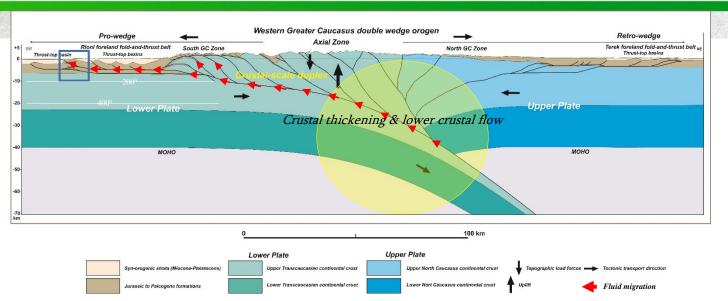
#### The main target is Middle Eocene and Cretaceous fractured rocks



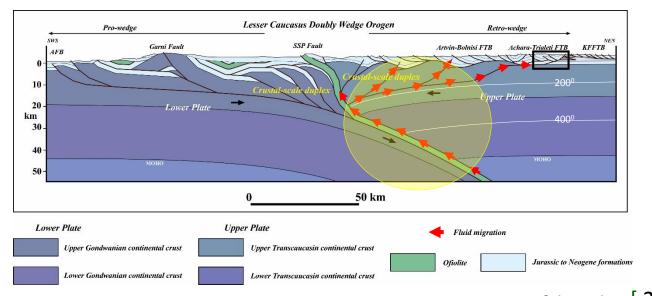
Map of thermal waters of the Georgia (Tsertsvadze, 1998). Blu line is a structural cross-sections.



Schematic cross-section (C-D) across Javakheti area -Lesser Caucasus (modified after D. Papava, 1975).



Lithospheric-scale structural cross-section (A-B) through western Greater Caucasus orogen (Alania, Enukidze Tevzadze, 2019).



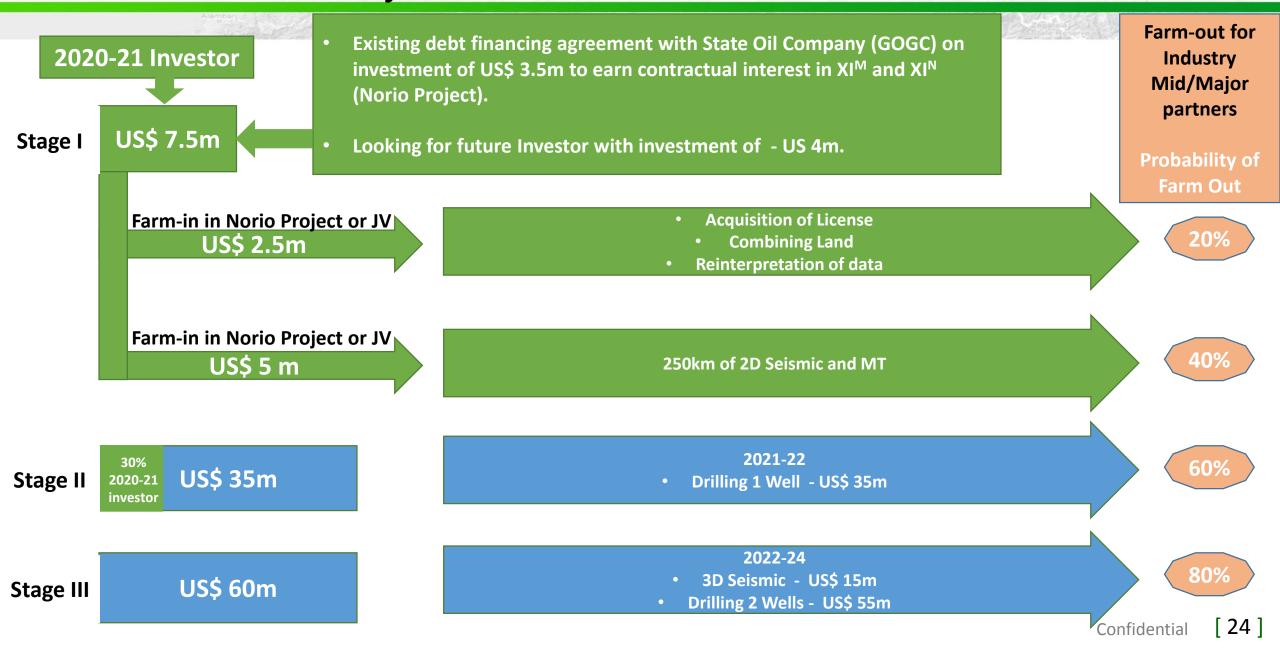
Lithospheric-scale structural cross-section (E-F) through Lesser Caucasus orogen (Alania, Enukidze, Tevzadze, 2020).



## **Norio Deep Project**

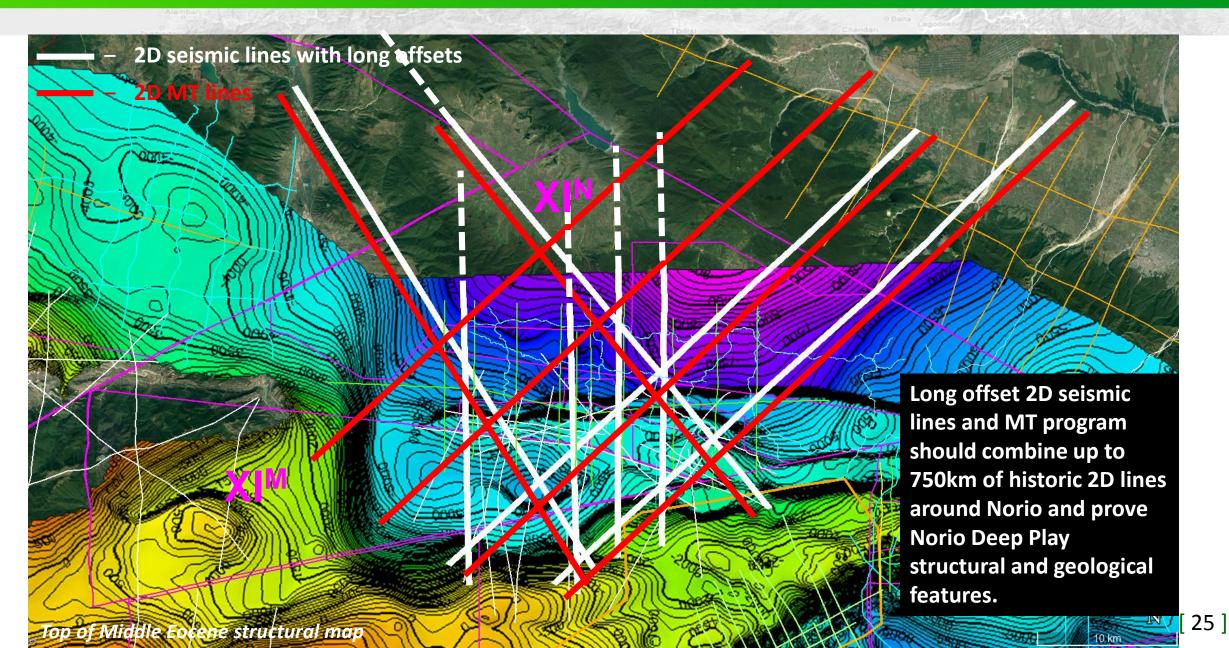
### GOG strategy for raising US\$ 7.5m for working program of 2020-21 and farm out 2021-24 for Norio Project





### Norio 2D seismic/MT work program (250 km)





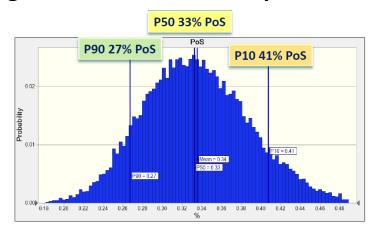
#### Norio WP 2020-21 target figures for geological chance of success is 30%+



- Seismic/MT program with combination of reinterpretation 750 km 2D seismic around Norio
- Geochemical study
  - Basin modeling
- Creating static model for Middle Eocene formation
  - Using Samgori field analog

will allow reaching of following geological chance of success parameters:

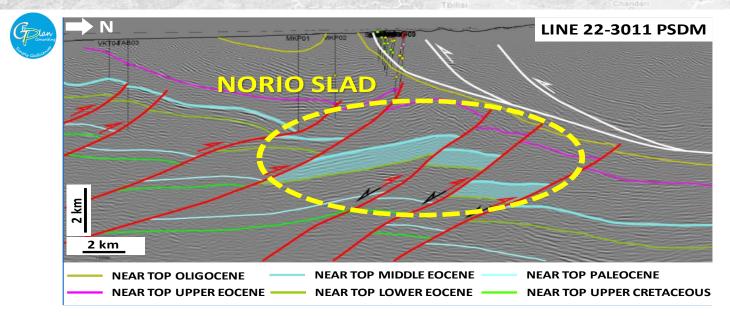
Structures	0.8
Seal	0.9
Migration	0.8
Reservoir	0.7
Source rock	0.8

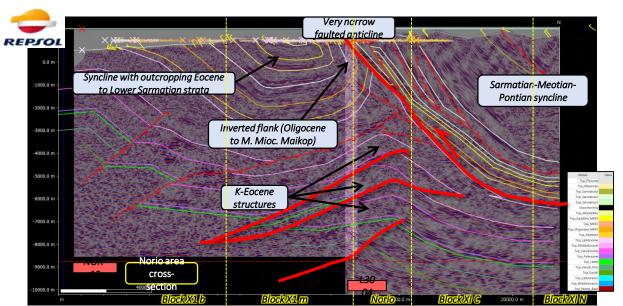


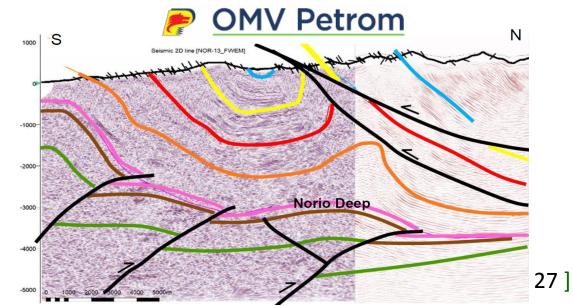
Norio Deep Project chance of geological success will increase from 20% to >>> 30%+

### Norio project interpretation similarities with industry partners



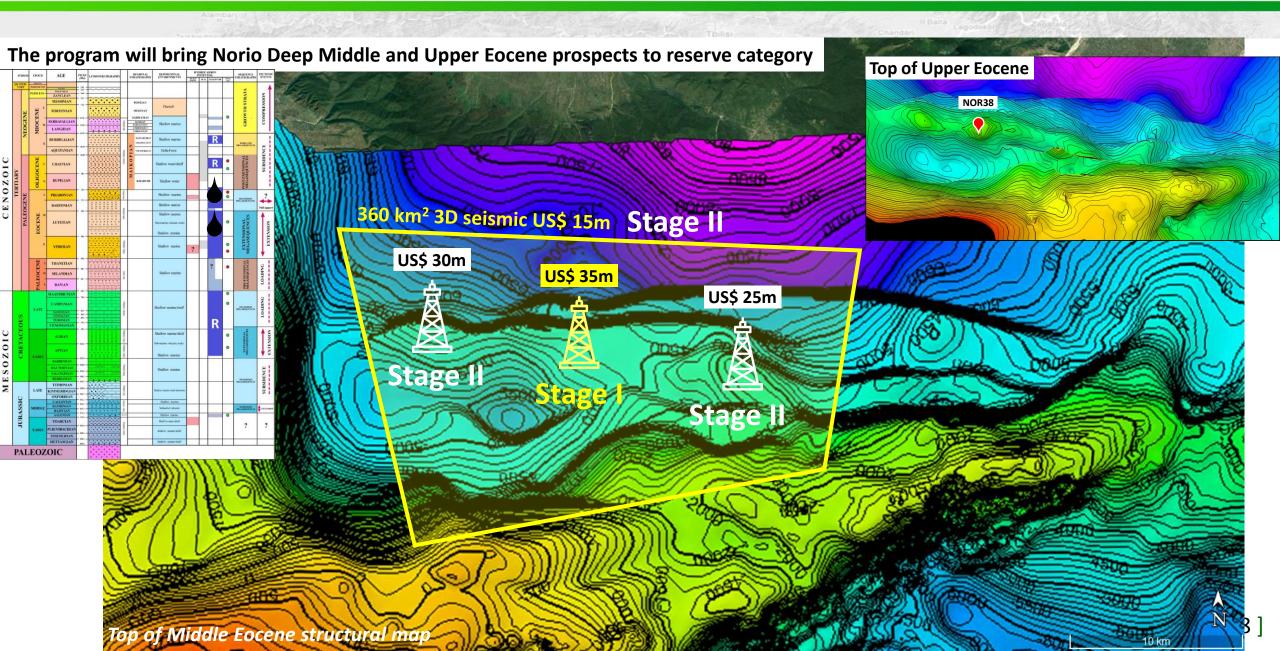






### Farm-out work program for major-mid size company (US\$ 105m)





### Preliminary resource calculation for Norio Deep Eocene project (ongoing)



NORIO DEEP PROSPECT: MIDDLE EOCENE RESERVOIR (GAS)									
MIDDLE EOCENE (MATRIX)	MIDDLE EOCENE (FRACTUR	MIDDLE EOCENE (FRACTURES)							
SPILL (m)	-4500	-4650	-4800	SPILL (m)	-4500	-4650	-4800		
POROSITY	0.04	0.05	0.06	POROSITY	0.006	0.008	0.01		
N/G	0.15	0.2	0.25	N/G	1	1	1		
Bg	0.00269	0.00261	0.00253	Bg	0.00269	0.00261	0.00253		
Sg	0.65	0.7	0.75	Sg	0.75	0.8	0.85		
BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	16977	27700	41550	BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	16977	27700	41550		
PORE VOLUME (10 <sup>6</sup> m3)	102	277	623	PORE VOLUME (10 <sup>6</sup> m3)	102	222	416		
GIIP (10 <sup>6</sup> m <sup>3</sup> )	24597	74365	184409	GIIP (10 <sup>6</sup> m <sup>3</sup> )	28381	67991	139331		
RF	0.6	0.65	0.7	RF	0.7	0.75	0.8		
RECOVERABLE GAS (10 <sup>6</sup> m <sup>3</sup> )	14,758	48,337	129,086	RECOVERABLE GAS (10 <sup>6</sup> m <sup>3</sup> )	19,867	50,993	111,465		
RECOVERABLE GAS (Bcf)	521	1,707	4,559	RECOVERABLE GAS (Bcf)	702	1,801	3,936		

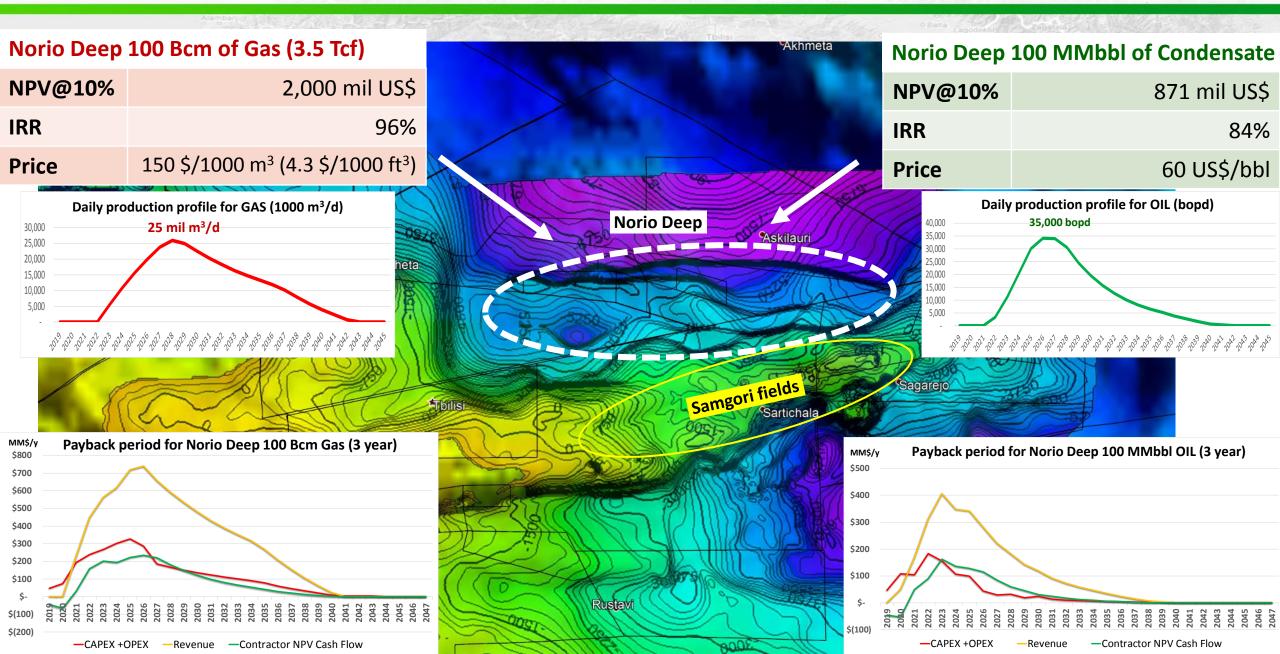
3.5 Tcf of gas and 100 MMbbl of oil are used as the preliminary resource for NPV, IRR figures (see next slide)

NORIO DEEP PROSPECT: MIDDLE EOCENE RESERVOIR (CONDENSATE)								
MIDDLE EOCENE (MATRIX)			MIDDLE EOCENE (FRACTURES)					
SPILL	-4500	-4650	-4800	SPILL	-4500	-4650	-4800	
POROSITY	0.04	0.05	0.06	POROSITY	0.006	0.008	0.01	
N/G	0.15	0.2	0.25	N/G	1	1	1	
Во	1.6	1.65	1.7	Во	1.60	1.65	1.70	
So	0.70	0.75	0.80	So	0.75	0.80	0.85	
BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	16977	27700	41550	BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	16977	27700	41550	
PORE VOLUME (10 <sup>6</sup> m3)	102	277	623	PORE VOLUME (10 <sup>6</sup> m3)	102	222	416	
STOOIP (10 <sup>6</sup> m <sup>3</sup> )	45	126	293	STOOIP (10 <sup>6</sup> m <sup>3</sup> )	48	107	208	
STOOIP (MMbbl)	280	791	1842	STOOIP (MMbbl)	300	675	1305	
RF	0.1	0.15	0.2	RF	0.35	0.4	0.45	
RECOVERABLE OIL (10 <sup>6</sup> m <sup>3</sup> )	4.5	18.9	58.7	RECOVERABLE OIL (10 <sup>6</sup> m <sup>3</sup> )	16.7	43.0	93.5	
RECOVERABLE OIL (MMbbl)	28	119	369	RECOVERABLE OIL (MMbbl)	105	270	588	

NORIO DEEP PROSPECT: UPPER EOCENE RESERVOIR (OIL)								
MIDDLE EOCENE (MATRIX)			MIDDLE EOCENE (FRACTURI	MIDDLE EOCENE (FRACTURES)				
SPILL	-2300	-2400	-2500	SPILL	-2300	-2400	-2500	
POROSITY	0.1	0.13	0.15	POROSITY	0.005	0.006	0.007	
N/G	0.15	0.2	0.25	N/G	0.75	0.8	0.85	
Во	1.5	1.6	1.7	Во	1.5	1.6	1.7	
So	0.55	0.6	0.65	So	0.60	0.65	0.70	
BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	2472	8581	13575	BULK VOLUME (10 <sup>6</sup> m <sup>3</sup> )	2472	8581	13575	
PORE VOLUME (10 <sup>6</sup> m3)	37	223	509	PORE VOLUME (10 <sup>6</sup> m3)	9	41	81	
STOOIP (10 <sup>6</sup> m <sup>3</sup> )	14	84	195	STOOIP (10 <sup>6</sup> m <sup>3</sup> )	4	17	33	
STOOIP (MMbbl)	85	525	1222	STOOIP (MMbbl)	23	105	209	
RF	0.1	0.15	0.2	RF	0.35	0.4	0.45	
RECOVERABLE OIL (10 <sup>6</sup> m <sup>3</sup> )	1.4	12.5	38.9	RECOVERABLE OIL (10 <sup>6</sup> m <sup>3</sup> )	1.3	6.7	15.0	
RECOVERABLE OIL (MMbbl)	9	79	245	RECOVERABLE OIL (MMbbl)	8	42	94	

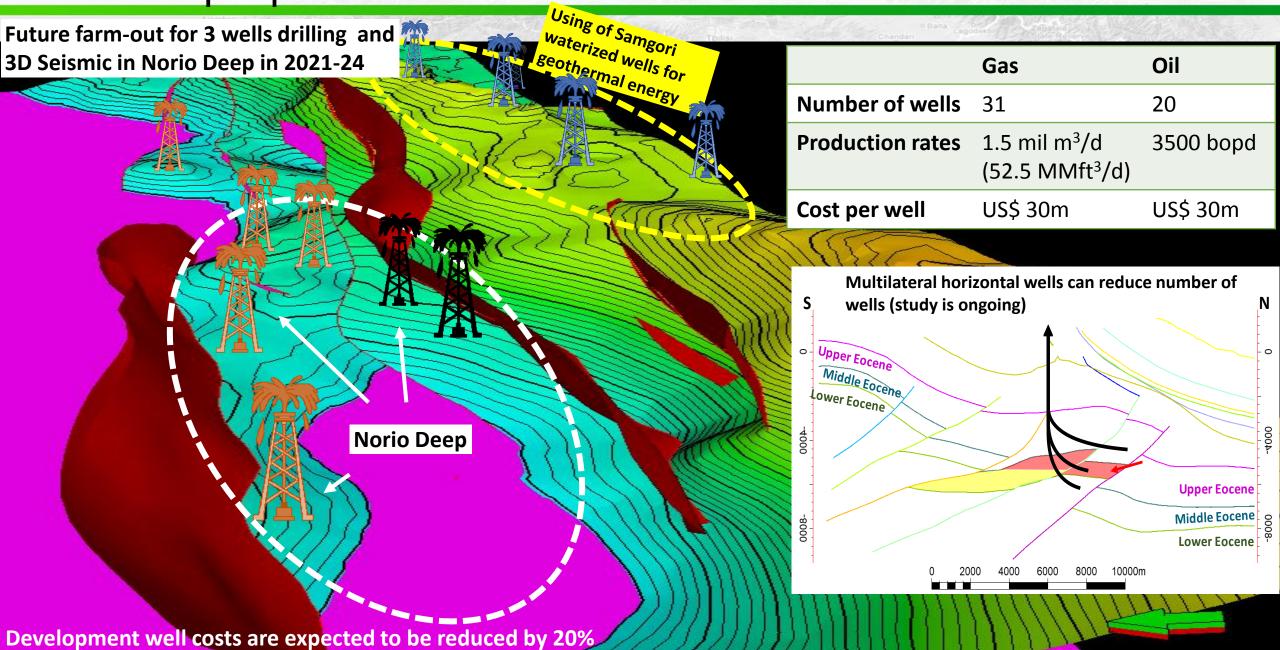
### Preliminary economic calculations for Norio Deep gas & condensate prospect





Economic parameters used for NPV calculations for Norio Deep gas & condensate prospect







### Thank you for attention!

Interested parties in GOG Projects data room are welcome to visit EPI Office in UK from 15<sup>th</sup> - 30<sup>th</sup> April, 2020.

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Interested parties in GOG Projects data room and Georgian Wine and Chacha culture welcome to visit GOG Office in Georgia:

from 1<sup>st</sup> - 15<sup>th</sup> May, 2020.

4A, Freedom Square, Entrance 2, Floor 5., Tbilisi 0105, Georgia mikheil@georgiaoilandgas.ge