



ABOVE GROUND

**ISRAELI GAS SECTOR - UPDATES & OPPORTUNITIES**  
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# ISRAEL GAS MARKET DEVELOPMENT

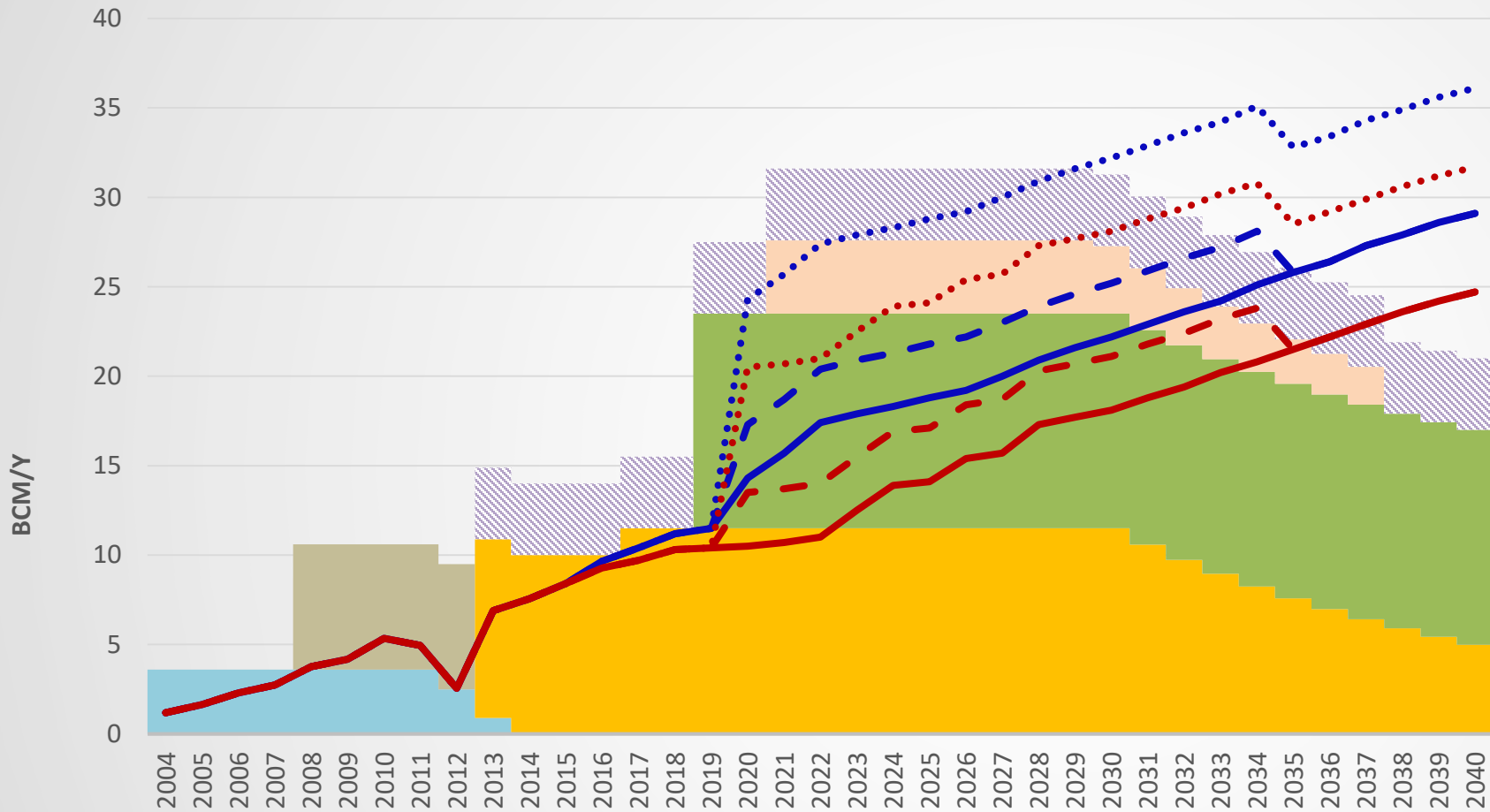




# ISRAEL GAS DEVELOPMENT COMPARISON

	Mari-B	Tamar	Leviathan	Karish
First gas	2003	2013	2019	2021
Capacity (BCM/year)	6.2	12.4	Phase-1A - 12.4 Phase-1B - 9 bcm (24-30 months from GSA)	8
Facility – water depth Distance from shore	237m (platform) 23 km (EEZ)	237m (platform) 22 km (EEZ)	86 m (platform) 10 km (TW)	1,750m (FPSO) 90 km (TW)
Total well depth (m)	2,082	4,900	5,095	5,260
Onshore area (dunam)	31	40	minimal	minimal

# Demand vs. Supply



- Mari-B
- Leviathan (604 bcm)
- BDO
- Adiri Scenario 6
- EMG
- Karish Tanin (63 bcm)
- BDO + Jordan
- Ministry + Jordan
- Tamar (318 BCM)
- LNG
- BDO + Jordan + Dolphinus
- Ministry + Jordan + Dolphinus

**Supply capacity (blocks):**  
development capacity by field  
(not sales per field)

**Sales (2004-2017) / Demand Forecast** in Israel (2018-2040) (lines). Based on BDO forecast 7/2017 (blue line) & NGA 11/2016 forecast (red line) (lower coal scenario); NGA also has higher coal scenario.

Jordan potential sales (dotted red & blue lines)

*Growth:*  
Coal to gas BUT  
Lacking infrastructure &  
Ministry wants 2<sup>nd</sup> LNG



# Export Options



1

## **Pipeline to PA, Jordan, Egypt**

*Local consumption and/or exports from Egypt*

2

## **Pipeline to Turkey or Greece**

*Sale to local markets & possibly onward to Europe*

3

## **LNG from Israel or Cyprus**

*Sale to Europe Far East*

4

## **FLNG or FCNG**

*LNG exports to Europe or Asia – CNG locally*

# DOLPHINUS: Bold Statements or Empty Words?

## REASONS FOR ANNOUNCEMENT

- Tamar Petroleum raising funds for Noble's shares; Delek needs to sell more shares by 2021
- Bloomberg published report that exports to Turkey not feasible
- Calypso discovery that might bring the gas to Egypt
- Energean: signing contracts, talk about double volumes, IPO in London, doubling of volumes
- Class action case on gas pricing & IEC demanding earlier price reopener

- Who is Dolphinus
- Gas prices in Egypt: c-\$3-8
- Leviathan export price: c-\$6.5
- No capacity in southern line
- What will be the delivery point
- No transmission to Idku
- Arbitration with Egypt

- El-Sissi:
  - "Egypt scored a goal"
  - Desire to be regional hub
  - Use the gas with added value
  - New law to open gas market
- Desire to damage Turkey

# EXPORT POLICY: Total exports allowed 450 bcm

## 2013 Government Decision

**All fields must be connected to the local market physically**

**Requirement to supply to the local market :**

<25 BCM	Local supply TBD by Petroleum Commissioner
25-100 BCM	Can export 75%; must reserve 25% for local market
100-200 BCM	Can export 60%; must reserve 40% for local market
>200 BCM	Can export 50%; must reserve 50% for local market

## 2018 Adiri: FUTURE DISCOVERIES WILL BE EXPORTED

**Requirement to connect to the local market:**

<50 BCM	Not required to connect to local market
50-200 BCM	Fields that commence commercial production by 1.1.2028 must connect to local market by 31.12.2031 (as determined by Petroleum Commissioner)
>200 BCM	Must connect immediately upon development

**Requirement to supply to the local market:**

<25 BCM	Not required to supply to the local market
1 BCM above 25 and up to 100	Can export 60%; must reserve 40% for local market
1 BCM above 100 and up to 200	Can export 50%; must reserve 50% for local market
1 BCM above 200	Can export 45%; must reserve 55% to local market

# Export Potential by Field (bcm)

BCM	Resource	Export allowed (% & Volume)	Exports GSPA	Remaining Exports
Tamar & Tamar SW	318	<ul style="list-style-type: none"> <li>• 50% of uncontracted volumes</li> <li>• +/- 56</li> </ul>	Jordan 1.8; Dolphinus 35 <b>TOTAL 37</b>	19
Dalit	15	<ul style="list-style-type: none"> <li>• 75%-100%*</li> <li>• 10-15</li> </ul>	0	10-15
Leviathan	604	<ul style="list-style-type: none"> <li>• 50% + Karish volumes</li> <li>• 350</li> </ul>	NEPCO: 45; Dolphinus 35 <b>TOTAL: 80</b>	270
Karish & Tanin	63**	<ul style="list-style-type: none"> <li>• 0%***</li> <li>• 0</li> </ul>	0	0
<b>Total</b>	<b>1,000 bcm</b>	<b>416 bcm</b>	<b>117 bcm</b>	<b>299 bcm</b>

\* 75% allowed & up to 100% at discretion of Ministry of Energy;  
 \*\* +69 bcm unrisks prospective resources  
 \*\*\* Export volumes swapped to Leviathan





# Signed Export Contracts

- ❖ **Jordan Arab Potash & Jordan Bromine: supplies started Jan 2017 (1.8 bcm)**
- ❖ **Jordan NEPCO: Leviathan to sell 45 bcm as of 2020**
- ❖ **Egypt Dolphinus: Leviathan & Tamar to sell 70 bcm (pipeline CP)**

# ISRAELI POWER SECTOR OPPORTUNITIES

- IEC to sell 5 gas operated power stations
- Process started on 1<sup>st</sup> station (Alon Tavor) to be sold by 2019
- Sites to be sold without their GSPA
- Opening for new sources of gas

2017	Installed Capacity		Energy Generated	
	MW	%	TWh	%
IEC	13,617	76%	48,788	71%
IPPs (Gas fired)	3,199	18%	17,735	26%
Renewables	1,021	6%	1,786	3%
<b>Total</b>	<b>17,837</b>	<b>100%</b>	<b>68,309</b>	<b>100%</b>

**Opportunities for foreign companies to invest in power sector: 4,500 MW gas fired power plants for sale**

**Electricity Generation Sites Sale Planned Schedule**

Site	Alon Tavor	Ramat Hovav	Reading	Old Hagit Sites	Eshkol	Total
<b>Expected Sale Year</b>	2019	2020	2021	2022	2023	
<b>Installed Capacity</b>	583MW	1,137MW	428MW	660MW	1,683MW	<b>4,491MW</b>

# FUTURE DISCOVERIES & EXPORT OPTIONS

## Export Options

1. Royee gas to Egypt via existing/new pipeline
2. Royee to connect to Leviathan platform for exports to Turkey
3. FLNG for global exports

**Opportunities for foreign companies to invest in offshore Israel drilling**

