

MOE PLAN & RENEWABLE ENERGY PLAN

3. MOE has already invested about **\$ 24.06** billion us dollar for the period **2006-2013** as follows:

- **\$13.97** billion for the new power plants installations with total capacity equal 18500 MW .
- **\$3.16** billion for the exist power plants rehabilitations.
- **\$3.85** billion for the transmission sector , installation of new 400 & 132 kV stations, rehabilitation and upgrading of old ones.
- **\$2.99** billion for the distribution sector covering the installation of new 33/11 kV substations, rehabilitation and upgrading of old ones.
- **\$0.09** billion for other supporting sectors such as Control & Operation , Inspection & Workshops and Training & Capacity Building.



Iraq Power Profile: Plans at Beginning of 2015



MOE's Generation Plan

- Encourage investment from IPPs (9GW of power)
- Target for conversion of Simple Cycle Plant to Combined Cycle (5GW)
- Encourage generation from renewable energy (Solar)
- Sustaining Current Plant Production through initiatives (such as the Power Up Plan Program by General Electric (GE) and other initiatives by other multinationals e.g. Siemens.)
- Plans for rehabilitation and reconstruction of Power Plants in the liberated areas

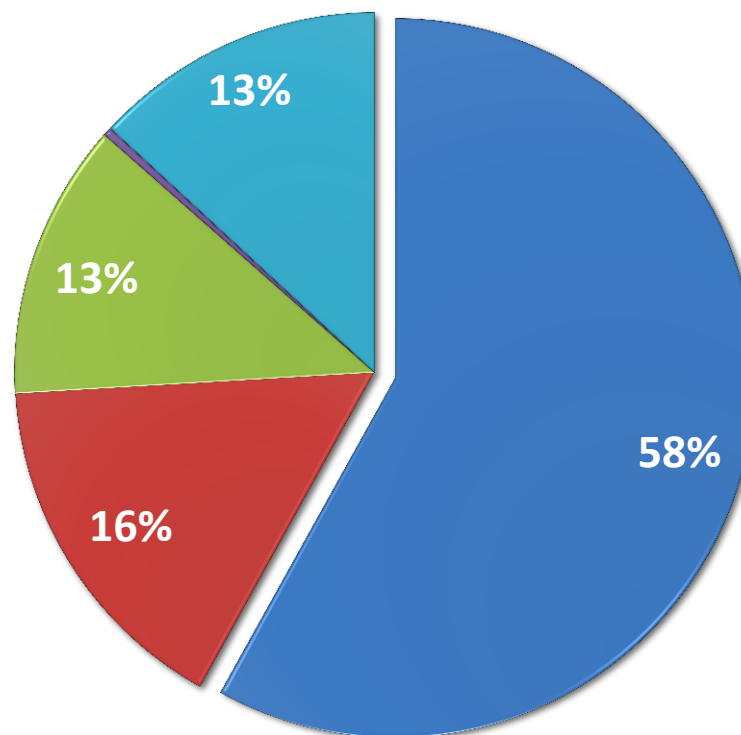
MOE's Transmission Plan

- Strengthening the transmission network throughout Iraq from South to Mid-Euphrates and Central areas of Iraq (JBIC, JICA, Siemens, GE, ABB).
- Plans for rehabilitation of substations, and transmission network in the liberated areas in north and west of Iraq to be reconnected with the rest of Iraq.

Invested budget in Electricity Sectors 2006-2013



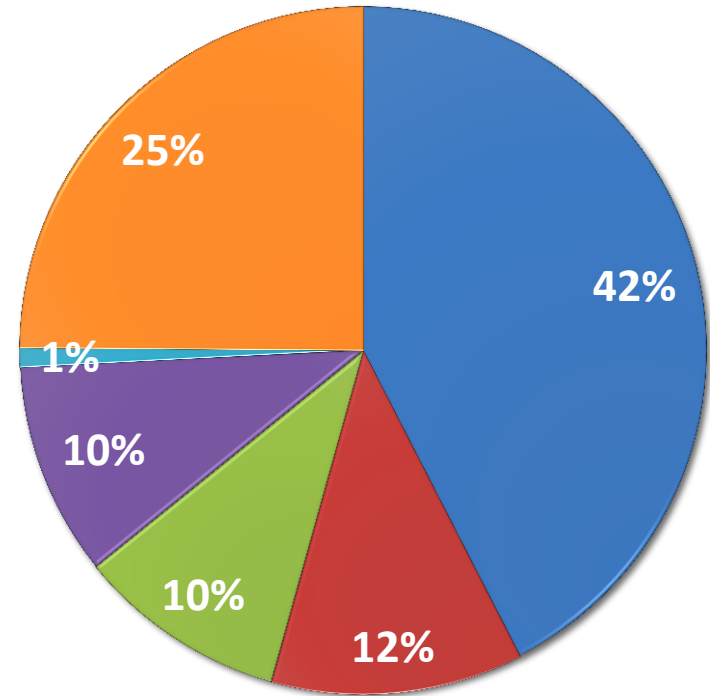
- Power generation projects
- Power transmission projects
- Power distribution projects
- Others
- Power generation rehabilitation



	Balance (BUSD) 2006-2013
Power generation projects	13.97
Power generation rehabilitation	3.16
Power transmission projects	3.85
Power distribution projects	2.99
Others	0.09
Total	24.06

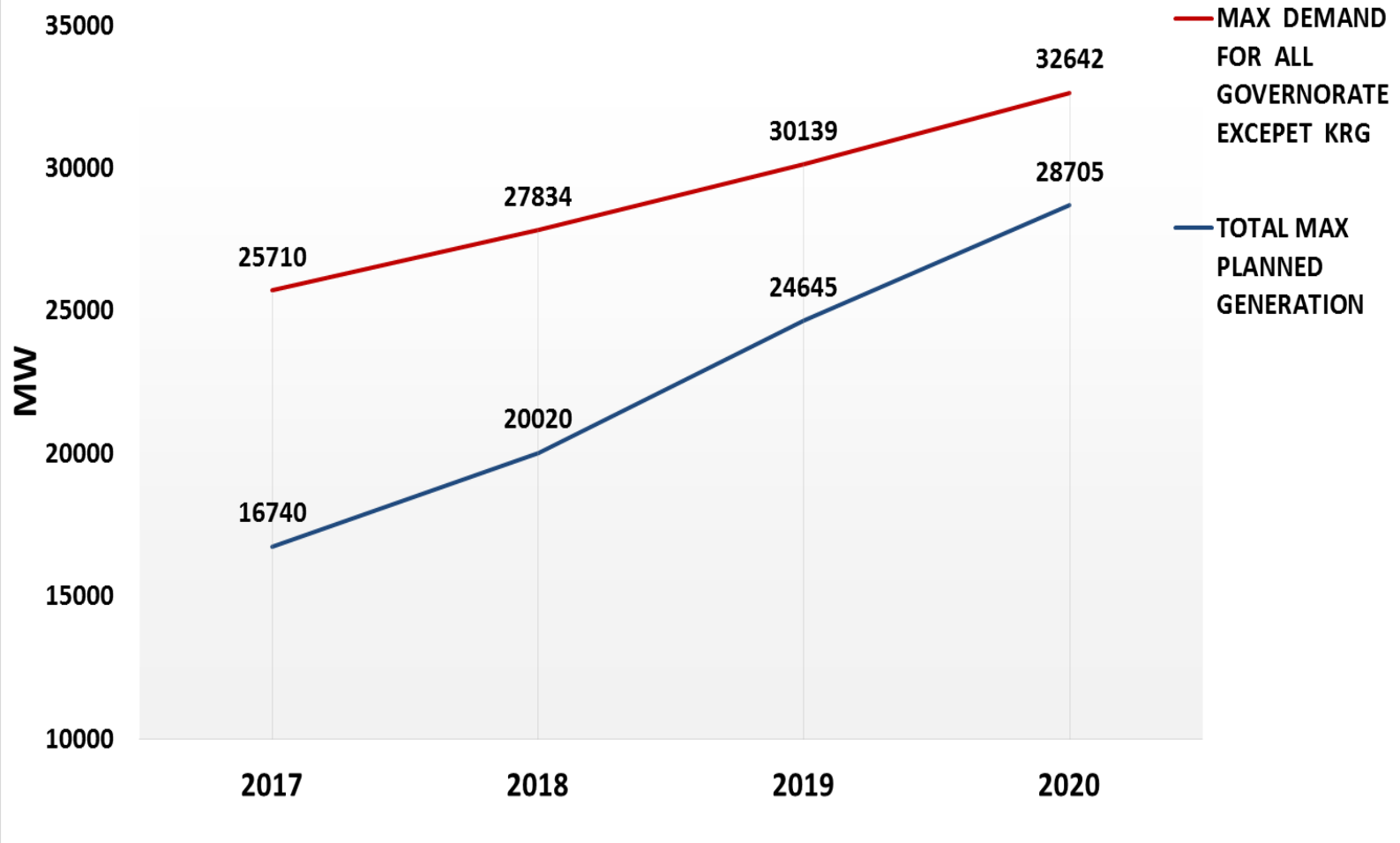
Invested budget in Electricity Sectors 2014-2015

- Power generation projects
- Power transmission projects
- Power distribution projects
- Power generation expenses
- Power transmission expenses
- Power distribution expenses



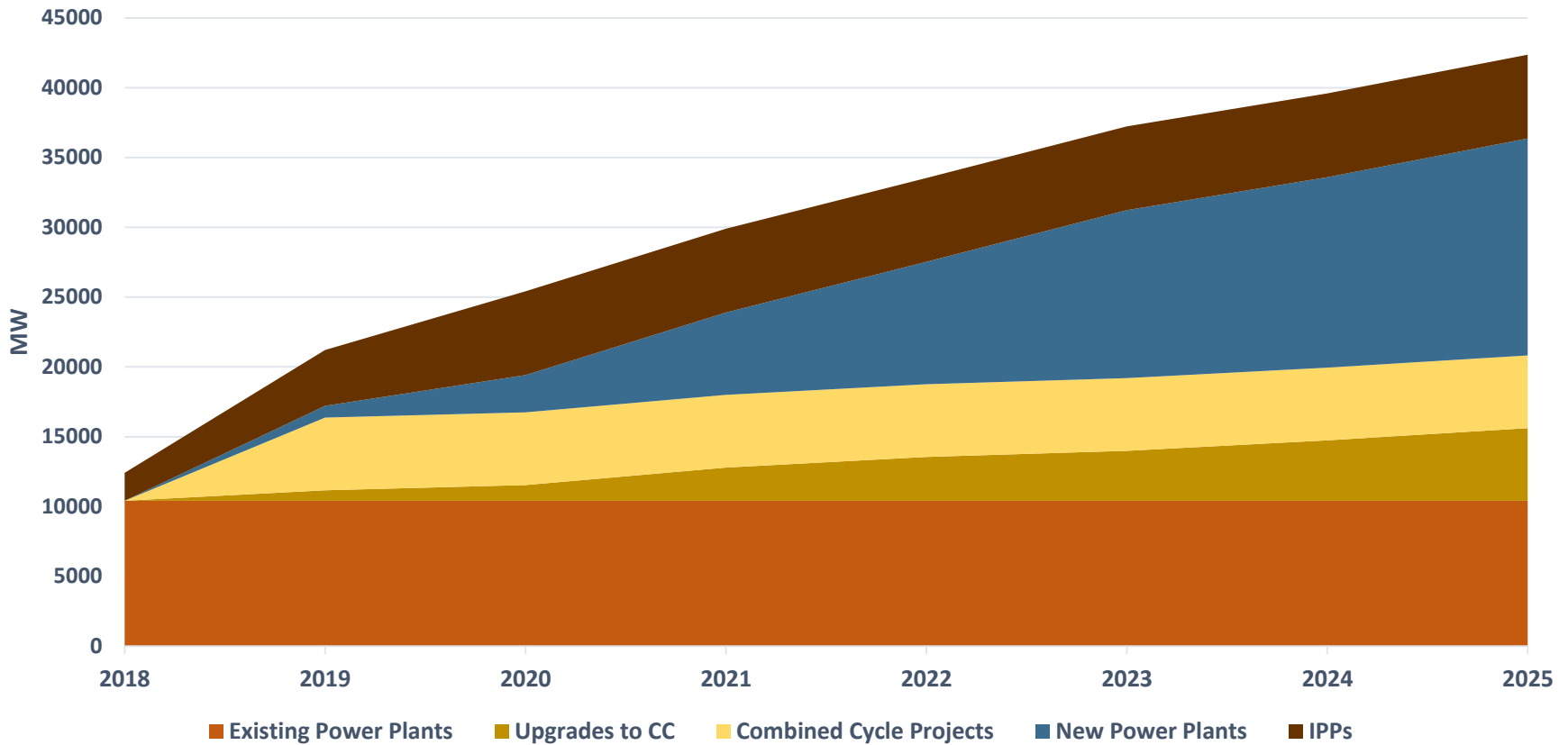
	2014 (BUSD)	2015 (BUSD)	Total
Power generation projects	1.223	0.1445	1.3675
Power transmission projects	0.342	0.1223	0.4643
Power distribution projects	0.284	0.0601	0.3441
Others	1.032	0.351	1.383
Total	2.881	0.6779	3.55

BALANCE OF DEMAND ACCORDING TO PLANNED GENERATION (2017-2020)



*** loss reduction and energy saving to narrow between demand and planned generation as early as possible**

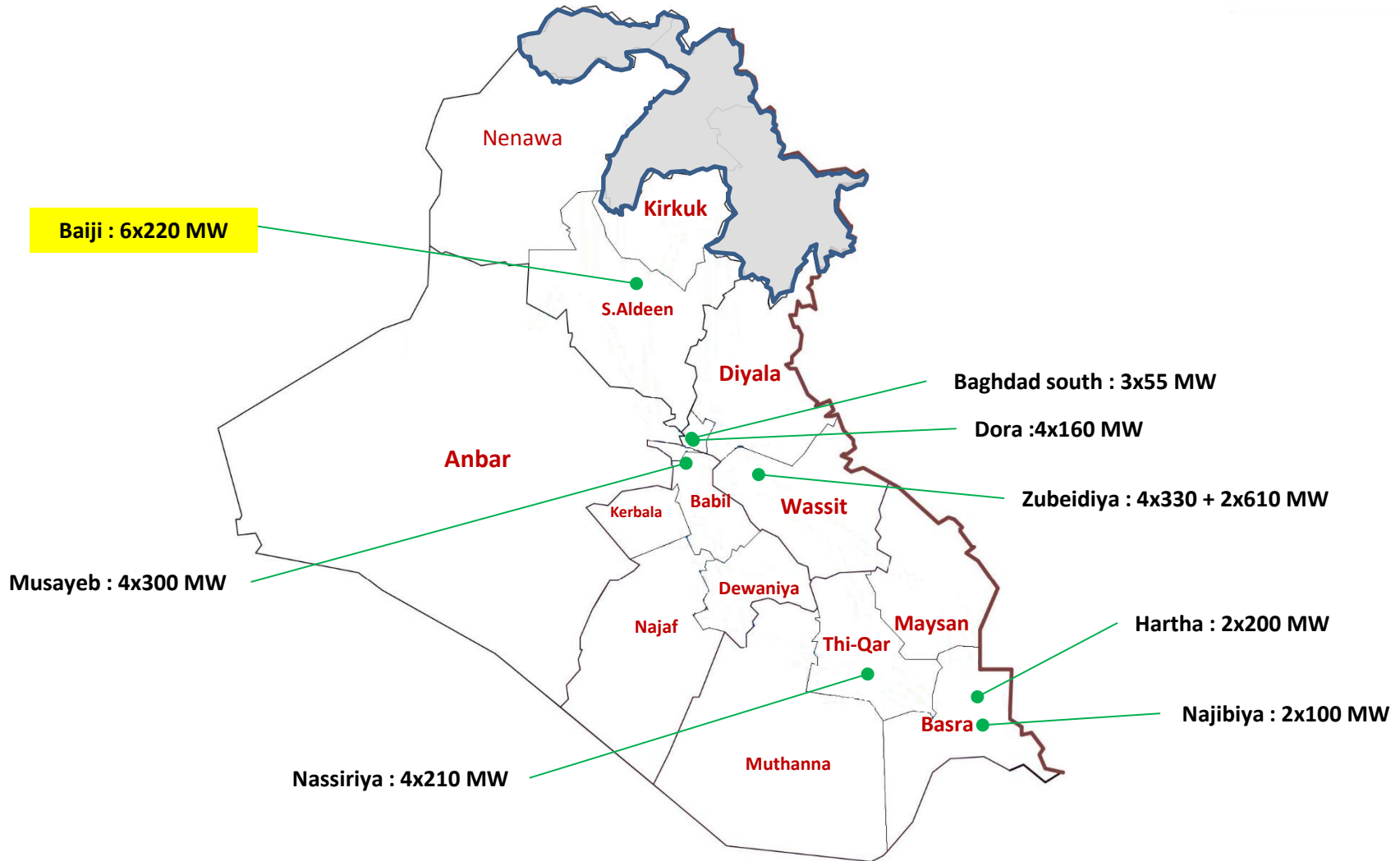
MOE generation Plan (2018-2025)



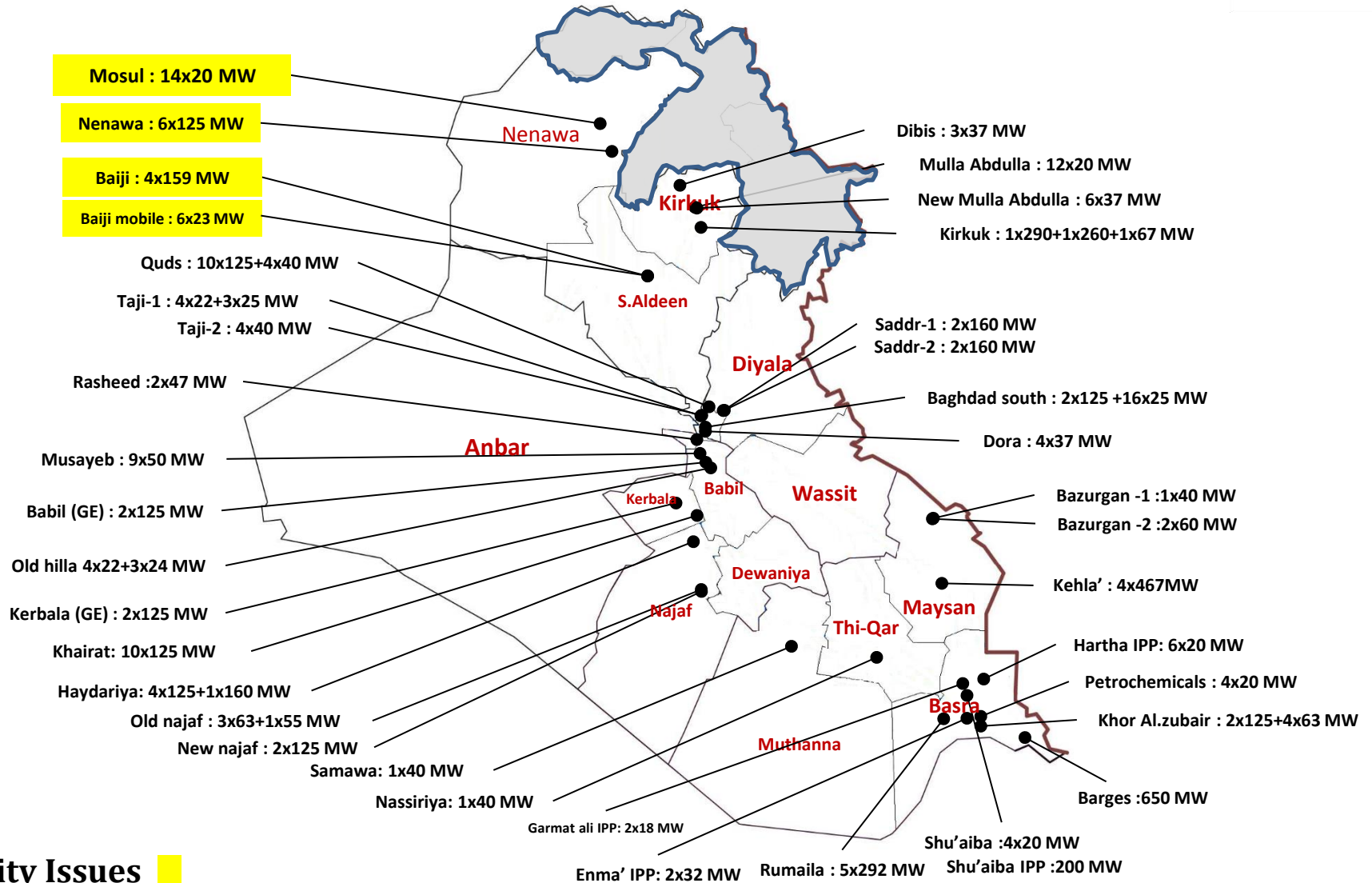
Present Peak Power Production (MW)

Type of Generation	Generated power (MW)				
	2003	2014	2015	2016	2017
Steam turbine	1840	3032	4541	4392	4224
Gas turbine	960	5827	6000	7327	8032
Diesel	----	852	528	211	305
Hydro	600	677	380	420	230
MOE generation	3400	10388	11449	12350	12791
Imports+ Barges	----	1932	1951	2005	1305
IPP Investment	---	---	---	---	1529
Total Peak Load Achieved	3400	12320	13400	14355	15625

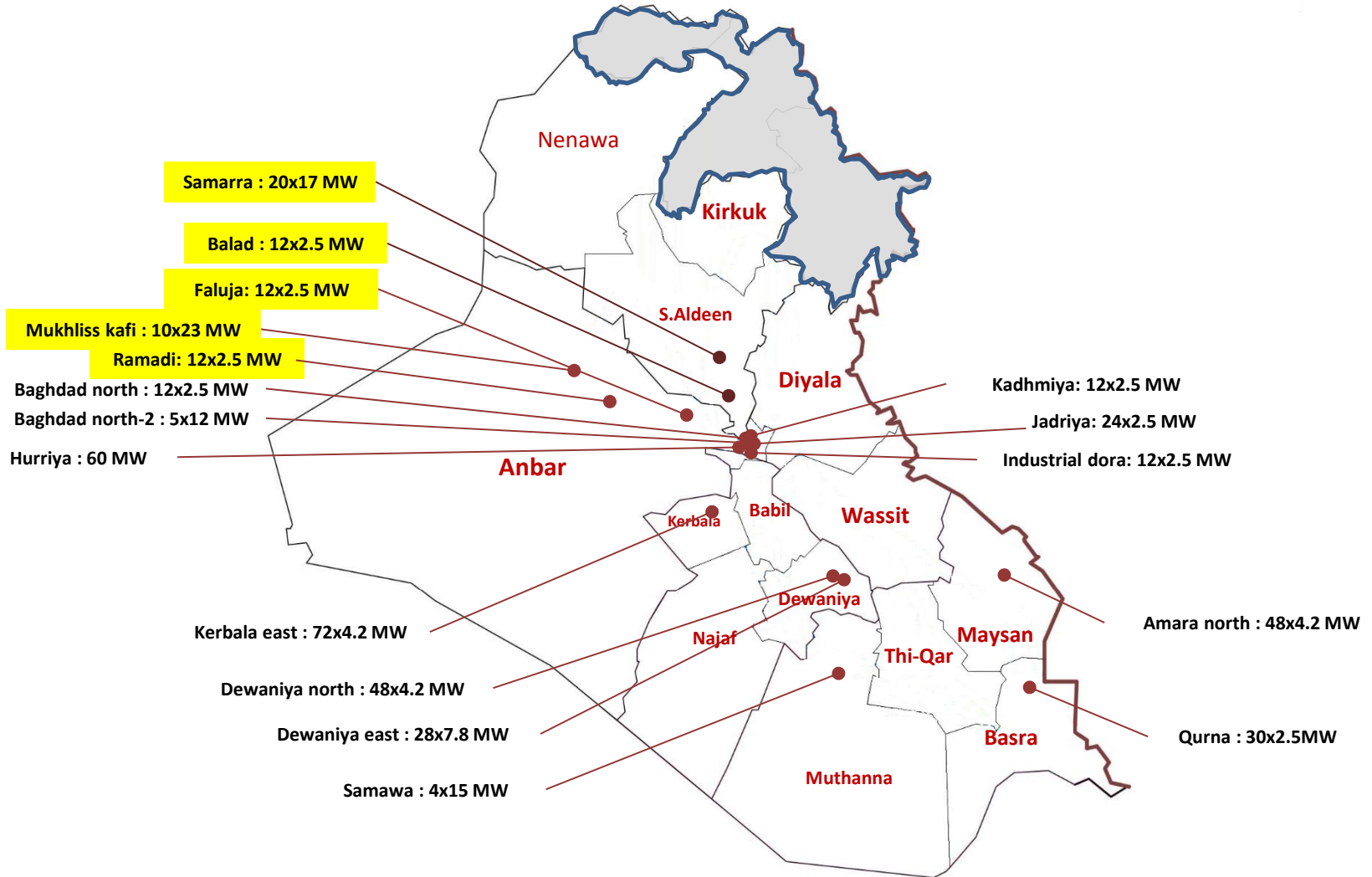
Steam turbine power plants locations & installed capacities 2016

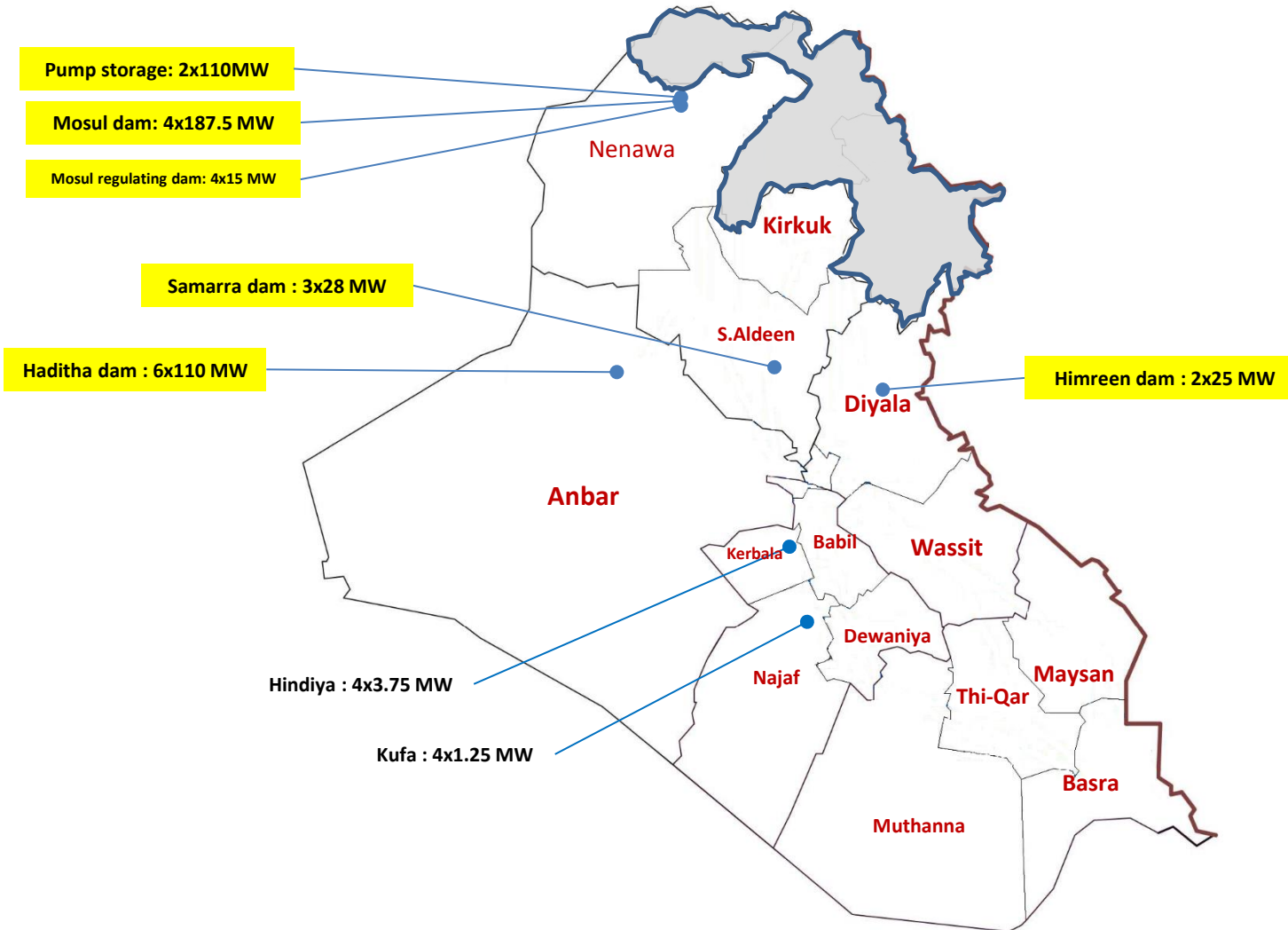


Gas turbine power plants locations & installed capacities 2016



Security Issues





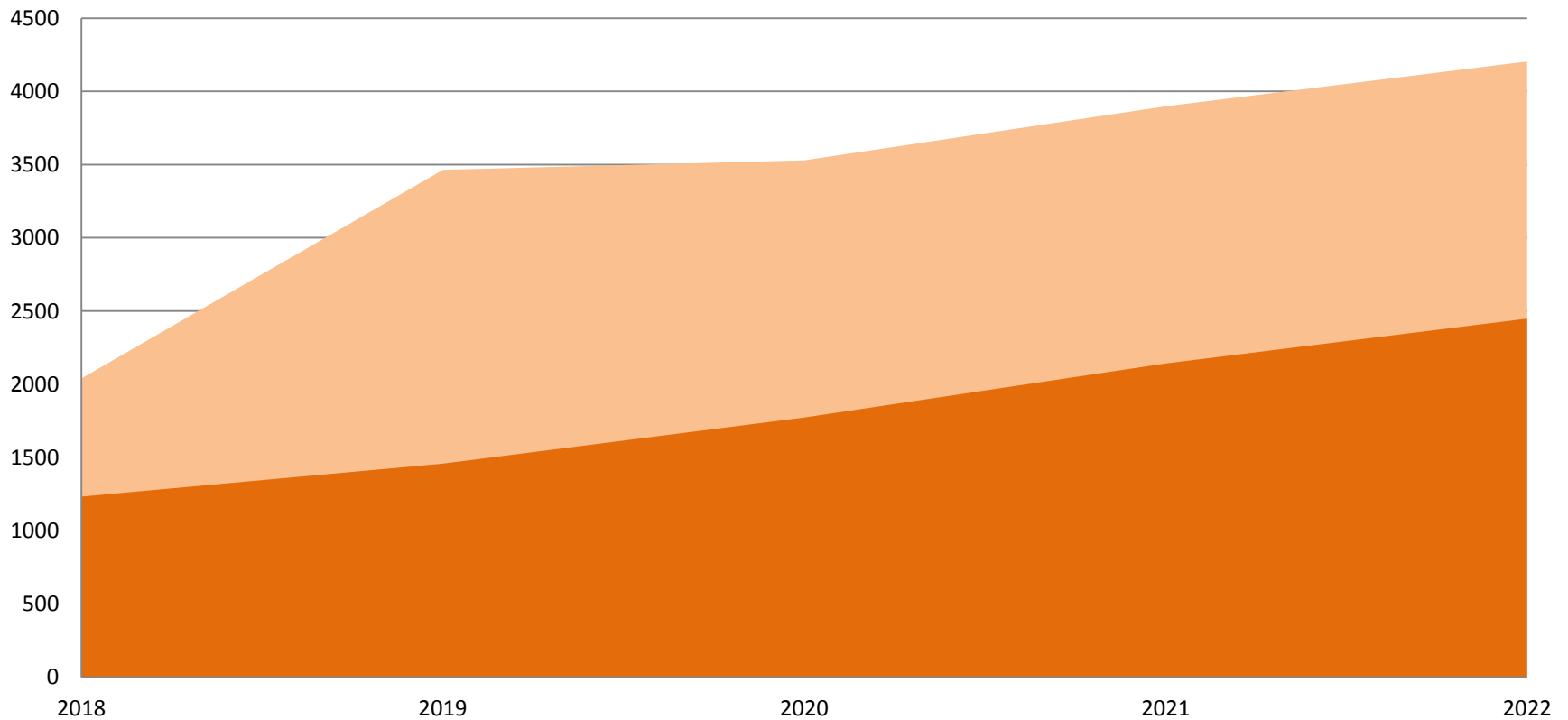


Ministry of Electricity



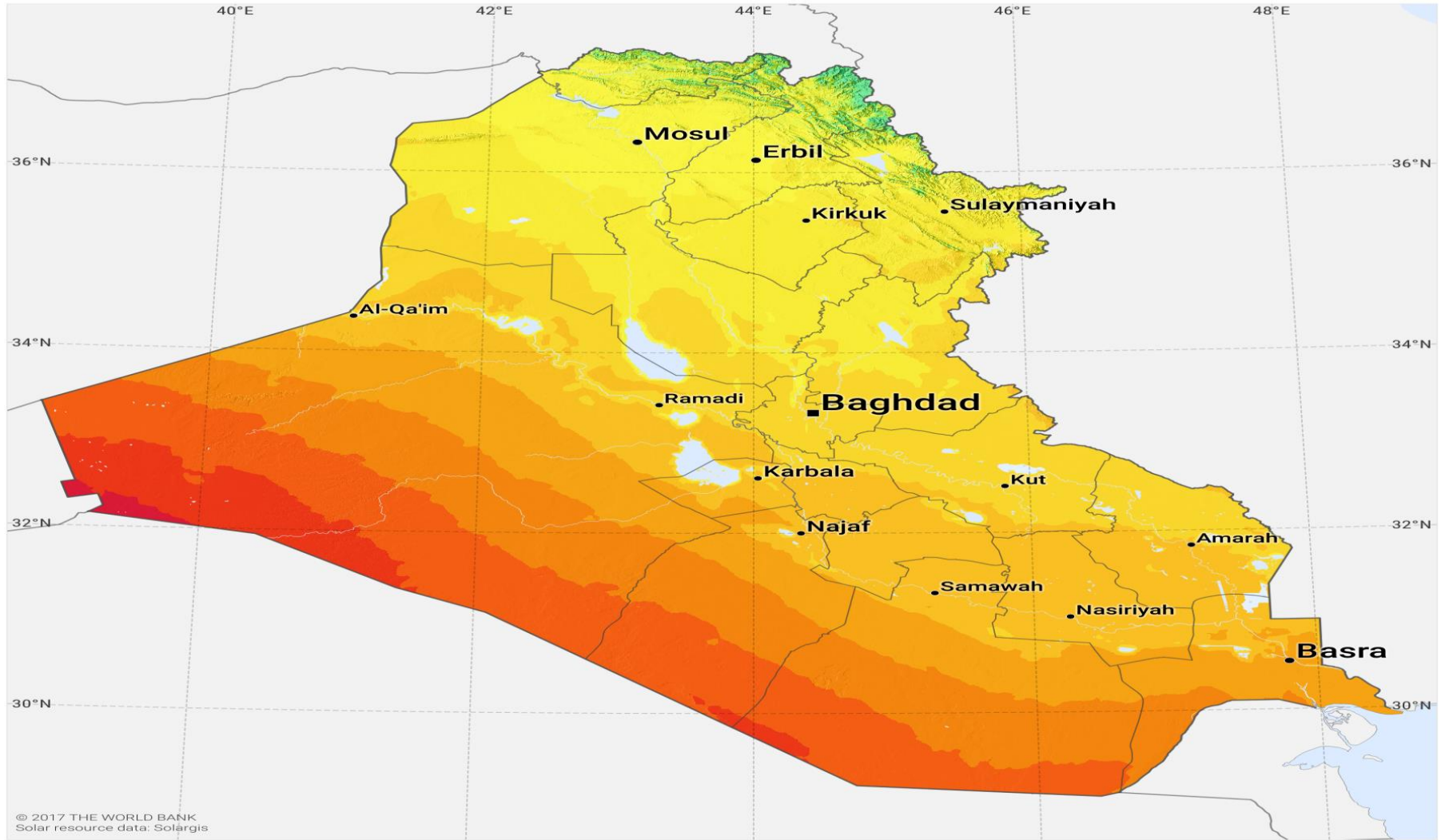
Total GAS Demand for Power Generation (MMscf)

■ Total Demand of gas supplied to power production ■ Domestically produced gas



RENEWABLE ENERGY PROGRAM





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Solar resource data: Solargis

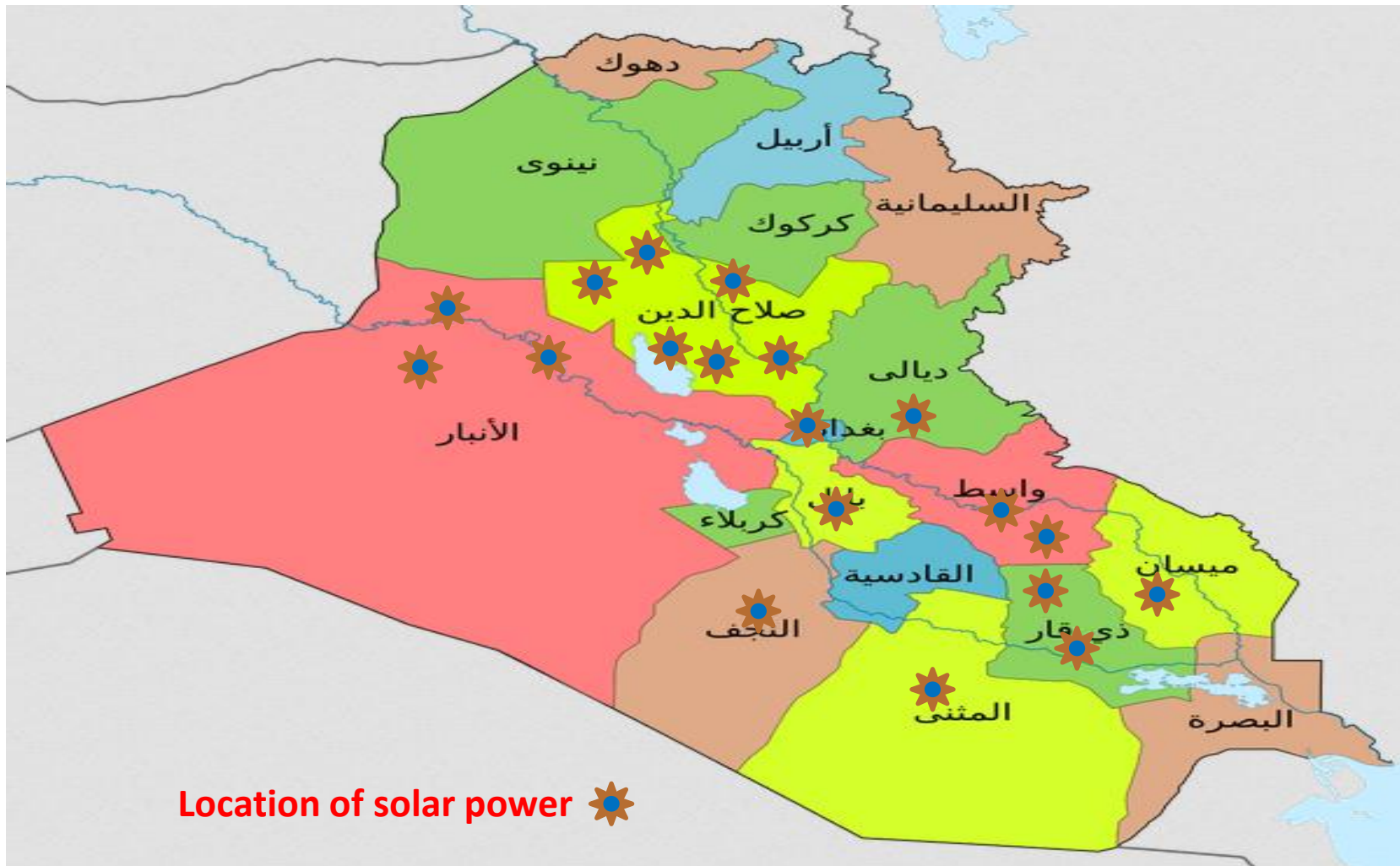
Long term average of GHI, period 1999-2015



MOE Plan For Investment in PV Solar Energy (2017-2020)

	Governorate	2017 (MW)	2018 (MW)	2019 (MW)	2020 (MW)	المجموع (MW)
1	Baghdad	15	30	30	30	105
2	Al Muthana	130	30	30	30	220
3	Al Najaf	100	50	50	50	250
4	Al Diwaniya	-	50	50	50	150
5	Dhi Qar	50	50	30	30	160
6	Messan	150	50	50	50	300
7	Al Anbar	430	100	100	100	730
8	Karbala	-	30	30	30	90
9	Wassit	75	30	30	30	165
10	Diyala	15	25	25	25	90
11	Babil	185	100	100	50	435
16	Total	1150	545	525	475	2695

MOE plan for investment in PV solar energy (2017-2020)



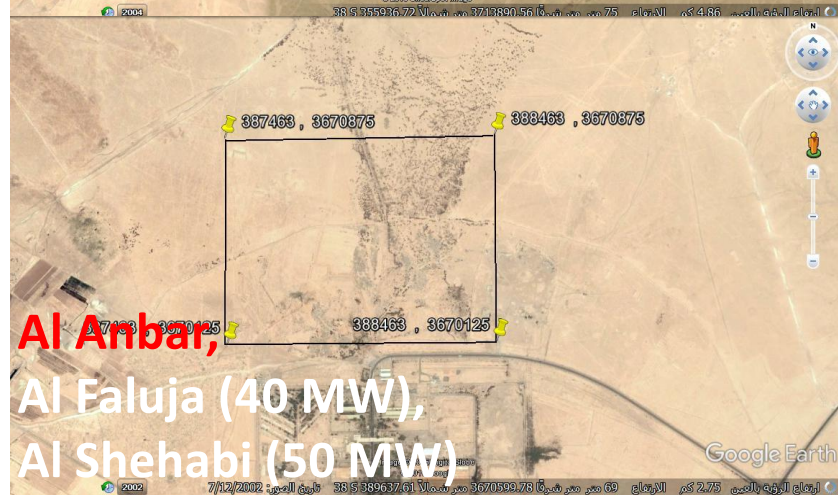
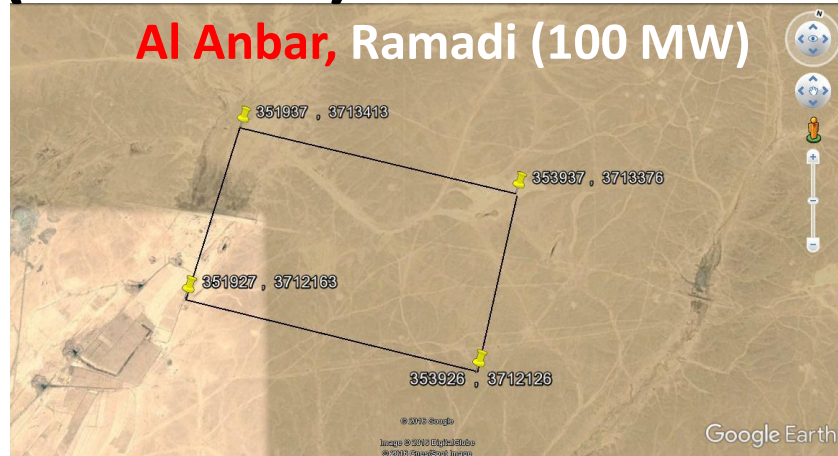
Potential Solar Photovoltaic (PV) projects sites information

	Suggested site	Governorate	Nearest station 132 kV	Voltage level (kV)	Type & No. connection lines	Extension line length (km)*	Available power (MW)	Remarks
1	Jissan	Wassit	Jissan	33	Overhead or underground cables.	1	50	Connect to Jissan 132kv through two 33kv feeders (Previously on 132kv for higher reliability)
2	Al- hay	Wassit	South Al-Kut	33	Overhead or underground cables.	3.2 / 3.3	25	There is two option for conection : connect to al -bashaer 33KV feeder (in/out)or connect to al-hay 33KVfeeder(in/out)
3	Diyala University	Diyala	Ba'quba south	33	Overhead or underground cables.		15	Ba'quba south 132 station
4	Abu Ghraib	Baghdad	Agargoff	33	Overhead or underground cables.	4	15	Connect to Agargoff 132kv through one 33kv feeder (previously on 132kv, shortage in 33kv feeders)
5	Haditha	Anbar	Mukhliss kafi Heet	132	Two teal overhead circuits.	0.25	40	Connect to one of Mukhliss kafi - Heet (1+2). (in/out)
6	Heet	Anbar	Heet	132	Two twin teal overhead circuits.	3.25	100	Connect to one of Ramadi east - Heet (1+2). (in-out)
				33	Overhead or underground cables.	3	50	connect to Heet 132 through two 33 kV feeders

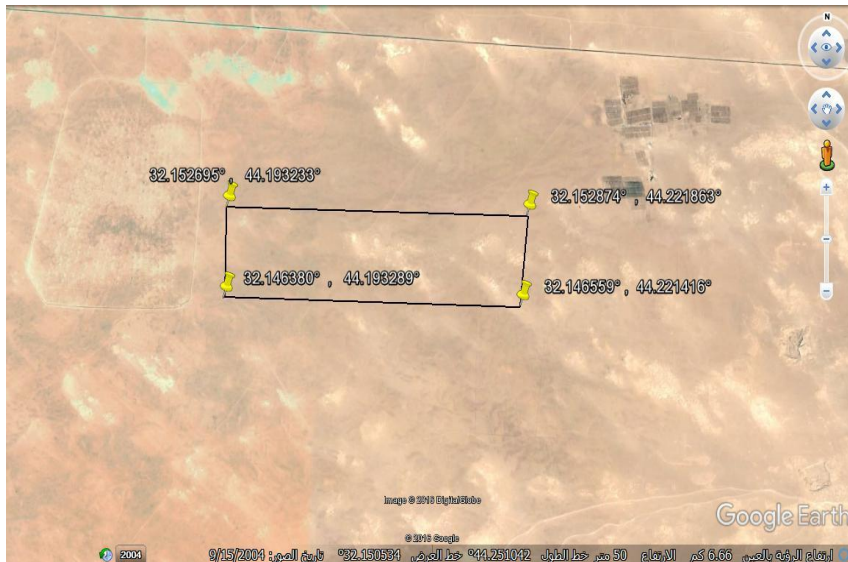
Potential Solar Photovoltaic (PV) projects sites information

	Suggested site	Governorate	Nearest station 132 kV	Voltage level (kV)	Type & No. connection lines	Extension line length (km)*	Available power (MW)	Remarks
7	A'miriyat Alfaluja	Anbar	Habbaniya	132	Two teal overhead circuits.	3	100	Connect to one of Habbaniya - Faluja (1+2). (in-out)
8	Amara	Messan		132	Tow teal overhead circuits	0.5	100	connect to amara-refai (1+2) in/out
9	Al-Dawaya	Dhi Qar	dawaya 33kv	33	two circuits	0.5	30	extension of two 33kv bays in dawaya 33kv station
10	Qalat Seker	Dhi Qar		132	two teal circuits	0.5	40	connect to djlh-refai, in/out
11	Sayeed Dekheel	Dhi Qar	fuhood	33	four circuits (33kv)	0.5	30	connect : fuhood - hammar (33kv feeder), in/out fuhood - chibayesh(33kv feeder), in/out
12	Salahaldin	Tikreet	Tikreet-Ojaa	33		8	50	
13	Salahaldin	Bajji	north bajji- sennea north bajji- tall abo iraad	33		6.5	40	
	Total						685	

The PV Solar Locations Awarded to Sama Baghdad Power Company (465 MW)



The PV Solar Locations Awarded to Al Dana International Co. for Trading and Contracting (230 MW)



Al Najaf

Al Haydariya (100 MW)



Al Muthana

Sawa1 (30 MW)

Sawa2 (50 MW)

Al Khidhir (50 MW)

Pilot project (Zayyoona district) Alley (710 ,712 ,714)

Zayyoona district

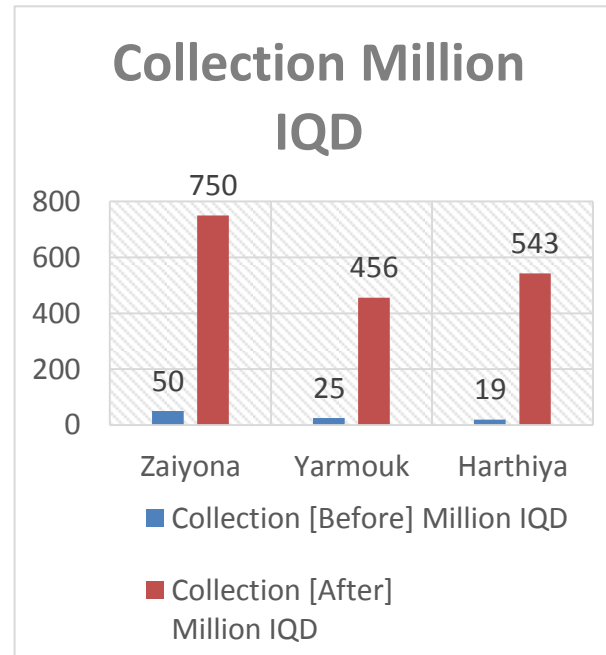
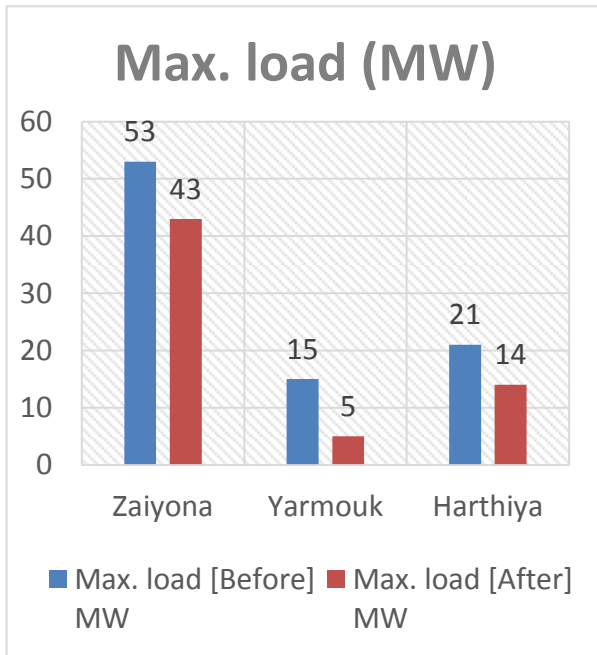
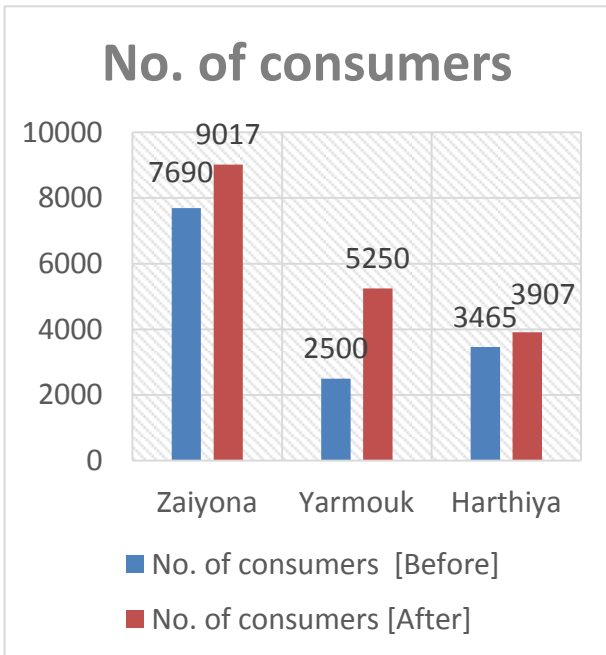
Service & bills collecting pilot project the following:
Alley 710
Alley 712
Alley 714



Total area load : 52 MW

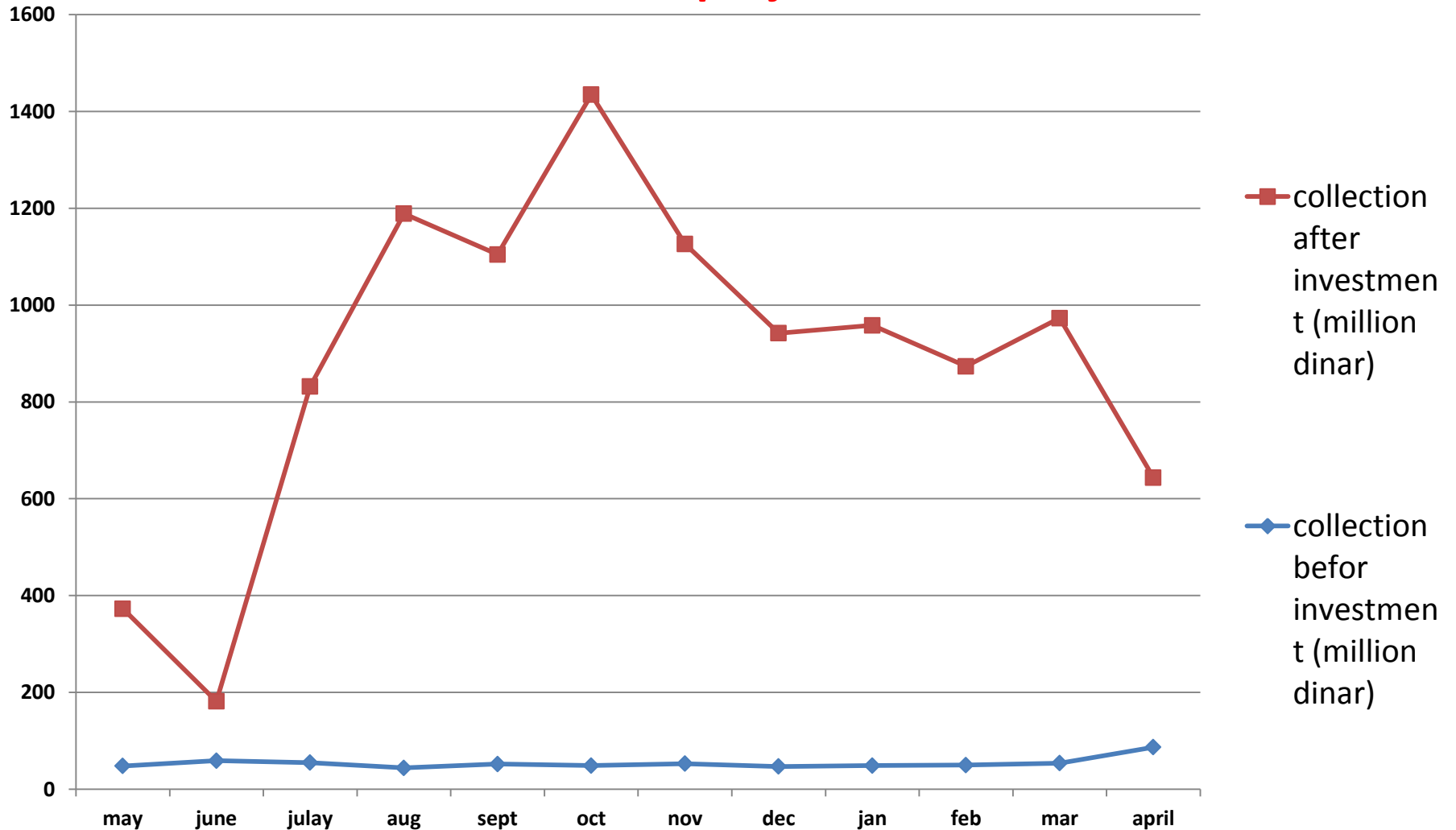
Up to date Public-Private sector partnership Results

No. of consumers, Max load and Collection



	No. of consumers [Before]	No. of consumers [After]	Max. load [Before] MW	Max. load [After] MW	Collection [Before] Million IQD	Collection [After] Million IQD
Zaiyona (average for one cycle)	7690	9017	53	43	50	750
Yarmouk (one collection cycle)	2500	5250	15	5	25	456
Harthiya (one collection cycle)	3465	3907	21	14	19	543

The monthly collection for Zayouna after completion of the private sector participation project



MOE Plan (2017-2023) With Fuel Subsidised

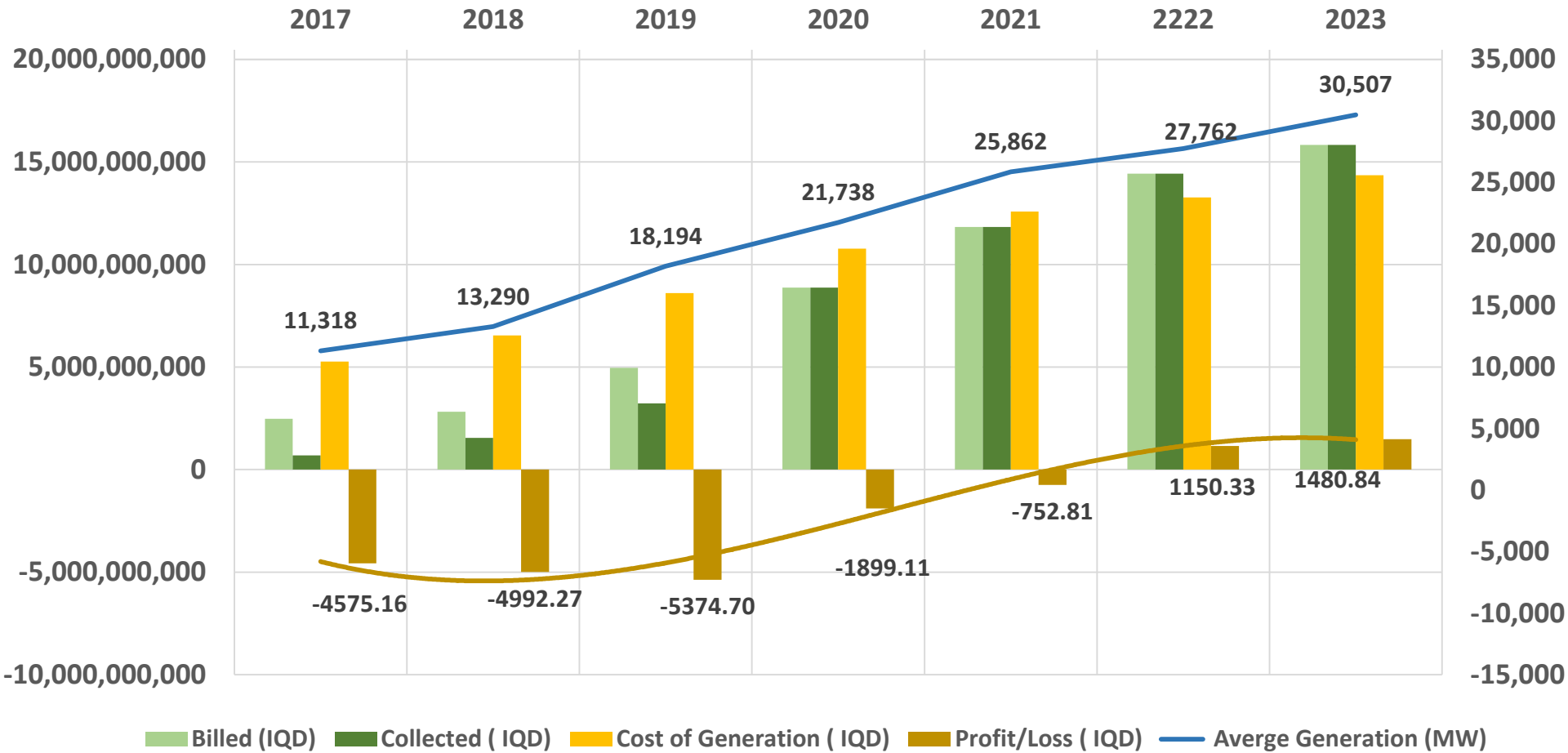
Year	2017	2018	2019	2020	2021	2222
Average Generation (MW)	11,318	13,290	18,194	21,738	25,862	27,762
Generation (MWh /year)	99,145,680	105,074,760	138,690,696	163,599,192	196,472,988	209,700,588
Tarrif (IQD/KW hr)	58	52	52	70	70	80
Power Delivered after Technical Losses (MWH)	85,265,285	90,364,294	119,273,999	143,972,421	168,966,770	180,342,506
Total potential Billing to be collected (IQD)	4,945,386,518	4,698,943,267	6,202,247,925	10,078,069,478	11,827,673,878	14,427,400,454
Non Technical Losses (unbilled and not collected) %	50%	40%	20%	12%	0%	0%
Billed (IQD)	2,472,693,259	2,819,365,960	4,961,798,340	8,868,701,141	11,827,673,878	14,427,400,454
Billed (MWh)	42,632,642	54,218,576	95,419,199	126,695,731	168,966,770	180,342,506
Collection Rate	28%	55%	65%	100%	100%	100%
Collected (IQD)	692,354,113	1,546,704,166	3,228,228,386	8,868,701,141	11,827,673,878	14,427,400,454
Energy collected by Tarrif (MWh)	11,937,140	29,744,311	62,081,315	126,695,731	168,966,770	180,342,506
Cost of losses (IQD)	4,253,032,406	3,152,239,101	2,974,019,539	1,209,368,337	0	0
Cost of Generation (IQD)	5,267,516,782	6,538,974,605	8,602,930,966	10,767,806,547	12,580,488,577	13,277,073,090
Profit/Loss (IQD)	-4,575,162,669	-4,992,270,440	-5,374,702,580	-1,899,105,406	-752,814,699	1,150,327,365
Total	14%	33%	52%	88%	100%	100%



Ministry of Electricity



MOE Plan (2017-2023) With Fuel Subsidized



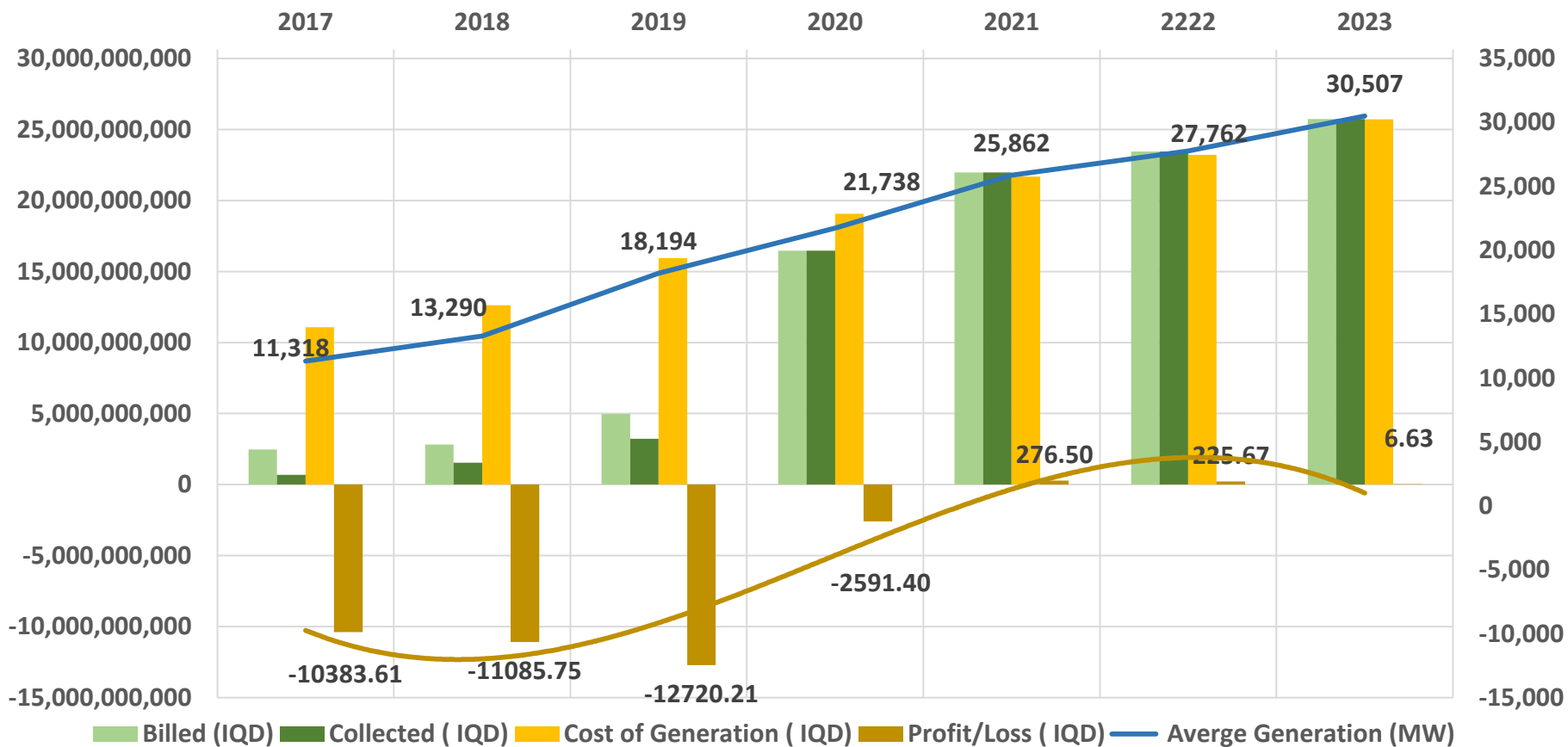
MOE Plan (2017-2023) With Fuel UNSubsidised

Year	2017	2018	2019	2020	2021	2222	2023
Average Generation (MW)	11,318	13,290	18,194	21,738	25,862	27,762	30,507
Generation (MWh /year)	99,145,680	105,074,760	138,690,696	163,599,192	196,472,988	209,700,588	230,133,288
Tarrif (IQD/KWhr)	58	52	52	130	130	130	130
Power Delivered after Technical Losses (MWh)	85,265,285	90,364,294	119,273,999	143,972,421	168,966,770	180,342,506	197,914,628
Total potential Billing to be collected (IQD)	4,945,386,518	4,698,943,267	6,202,247,925	18,716,414,746	21,965,680,058	23,444,525,738	25,728,901,598
Non Technical Losses (unbilled and not collected) %	50%	40%	20%	12%	0%	0%	0%
Billed (IQD)	2,472,693,259	2,819,365,960	4,961,798,340	16,470,444,976	21,965,680,058	23,444,525,738	25,728,901,598
Billed (MWh)	42,632,642	54,218,576	95,419,199	126,695,731	168,966,770	180,342,506	197,914,628
Collection Rate	28%	55%	65%	100%	100%	100%	100%
Collected (IQD)	692,354,113	1,546,704,166	3,228,228,386	16,470,444,976	21,965,680,058	23,444,525,738	25,728,901,598
Energy collected by Tarrif (MWh)	11,937,140	29,744,311	62,081,315	126,695,731	168,966,770	180,342,506	197,914,628
Cost of losses (IQD)	4,253,032,406	3,152,239,101	2,974,019,539	2,245,969,769	0	0	0
Cost of Generation (IQD)	11,075,963,816	12,632,458,637	15,948,435,545	19,061,847,605	21,689,176,084	23,218,854,117	25,722,274,960
Profit/Loss (IQD)	-10,383,609,704	-11,085,754,472	-12,720,207,159	-2,591,402,629	276,503,974	225,671,621	6,626,639
Total	14%	33%	52%	88%	100%	100%	100%

Ministry of Electricity



MOE Plan (2017-2023) With Fuel **Unsubsidized**



A low-angle, upward-looking shot of a modern skyscraper's glass facade. The grid of windows recedes into the distance, creating a strong sense of perspective. At the top of the building, a bright sunburst effect radiates outwards, casting a glow over the scene. The sky is a deep, clear blue. The overall mood is one of achievement and optimism.

Thank you