
Solar Rooftop

Perspective on Regulatory Frameworks and Emerging Business Models in the Middle East

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Muscat, Oman

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Focus on two key Middle Eastern DG Solar Markets: Jordan and Dubai

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- **General Electricity Law**

- Issued in 2002
- Key principle -- **single buyer model:**

Sole transmission company, NEPCO, is the exclusive purchaser of electricity from licenced electricity generators

The three distribution companies are the exclusive purchasers of electricity from generators connected to the *distribution* system

- **Renewable Energy Law**

- Issued in 2012
- First RE law in Middle East
- Provided a framework for the direct proposals process

Jordan

Self-Generation Regime

- Off grid projects
- No generation licence required

Net Metering / Wheeling Regulations

- Revised net metering regulation issued in Aug 2016
- Revision of wheeling regulation -- pending decision on wheeling fees
- Generation licence required if capacity over 5 MW

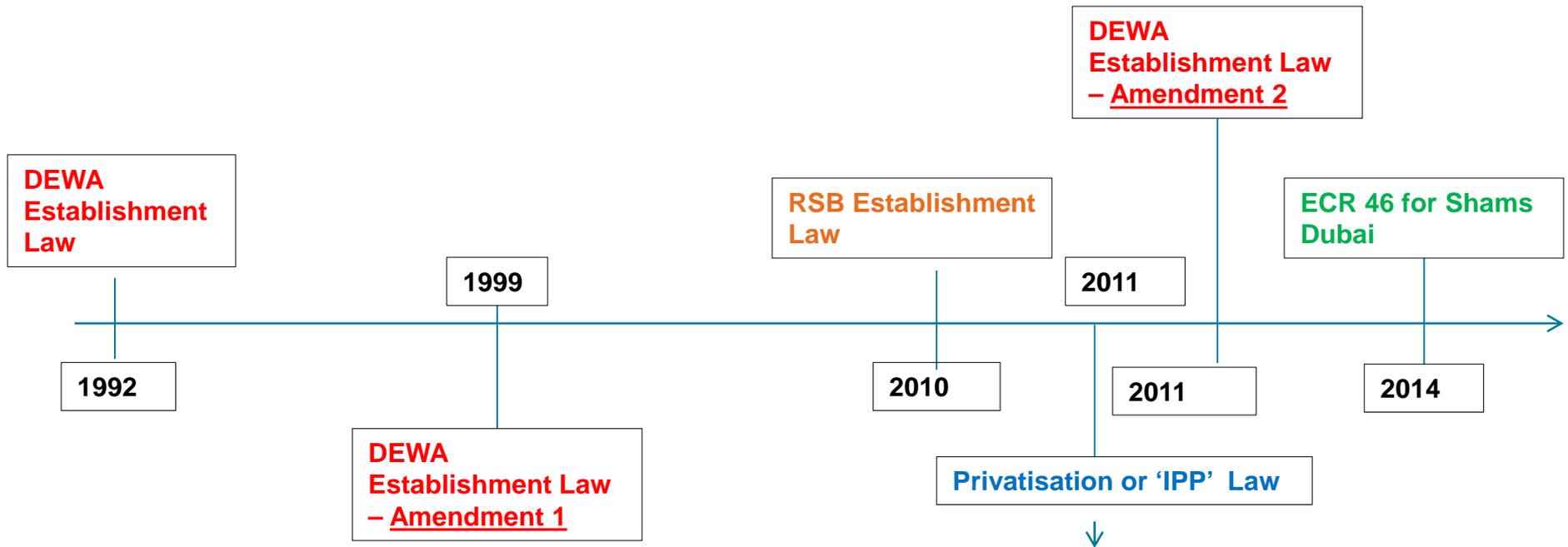
Insight into electricity tariffs

- Tariffs for residential users vary in accordance with consumption:
 - 1 - 160 kWh / month: 05 US\$ cents
 - 161 - 300 kWh / month: 10 US\$ cents
 - 301 - 500 kWh / month: 12 US\$ cents
 - 501 - 600 kWh / month: 16 US\$ cents
 - 601 - 750 kWh / month: 22 US\$ cents
 - 751 – 1,000 kWh / month: 27 US\$ cents
 - > 1,000 kWh / month: 37 US\$ cents

Tariffs for commercial and industrial consumers vary by sector:

- high-consuming telecoms company: 38.5 US\$ cents
- bank: **40 US\$ cents**

Dubai



DEWA's amended objectives include:
“purchase of electricity and water, to the exclusion of others, from any party at the price and cost which [DEWA] deems appropriate.”

Article 23:
“By virtue of this Law, a Licenced Entity [i.e. an entity licenced by RSB to generate electricity for the purposes of supplying to the transmission system] may not sell, supply or provide the produced electricity or water to any entity, whether inside or outside the Emirate, other than [DEWA].”

Dubai

Executive Council Resolution No. 46 of 2014 Concerning the Connection of Generators of Electricity from Solar Energy to the Power Distribution System in Dubai (“**ECR 46**”).



- Permission to:
 - build/operate solar power facilities (rooftop/ground-mounted) and connect to electricity distribution system
 - export excess power to electricity distribution system, for net metering credits
- Electricity generation and consumption must be on the same site. So, **no wheeling**
- DEWA accreditation scheme for contractors/ consultants
- DEWA sets Annual Connection Cap: max amount of solar generation capacity that may be connected to distribution system in one year (currently undefined)

Dubai

Power generation in respect of:

- any facility which is connected to the transmission system is a **regulated** activity and requires a generation licence from RSB pursuant to the Privatisation Law. Electricity generated by such facilities must be supplied to DEWA only.
- solar PV facility which is connected to the distribution system is a **regulated** activity and requires an approval from DEWA pursuant to ECR 46. DEWA is the regulator for this particular sector.
- any facility connected to distribution system – but which is not a solar PV facility approved by DEWA pursuant to ECR 46: **unregulated** (but subject to regulations prohibiting unauthorised grid access).
- off-grid facility: **unregulated**.

Dubai

Insight into electricity tariffs

Residential/Commercial

Consumption/ month		Slab tariff	US\$ Conversion of Slab tariff
G	0-10000 kWh	23 fils / kWh	6 cents / kWh
Y	10001 kWh & Above	38 fils / kWh	10 cents / kWh

Industrial

Consumption/ month		Slab tariff	US\$ Conversion of Slab tariff
G	0-2000 kWh	23 fils / kWh	6 cents / kWh
Y	2001-4000 kWh	28 fils / kWh	8 cents / kWh
O	4001-6000 kWh	32 fils / kWh	9 cents / kWh
R	6001 kWh and above	38 fils / kWh	10 cents / kWh

Plus a **fuel surcharge** (based on the rate of increase or decrease of the actual fuel cost supplied to DEWA generation plants): 6.5 fils / kWh (i.e. 2 US\$ cents)

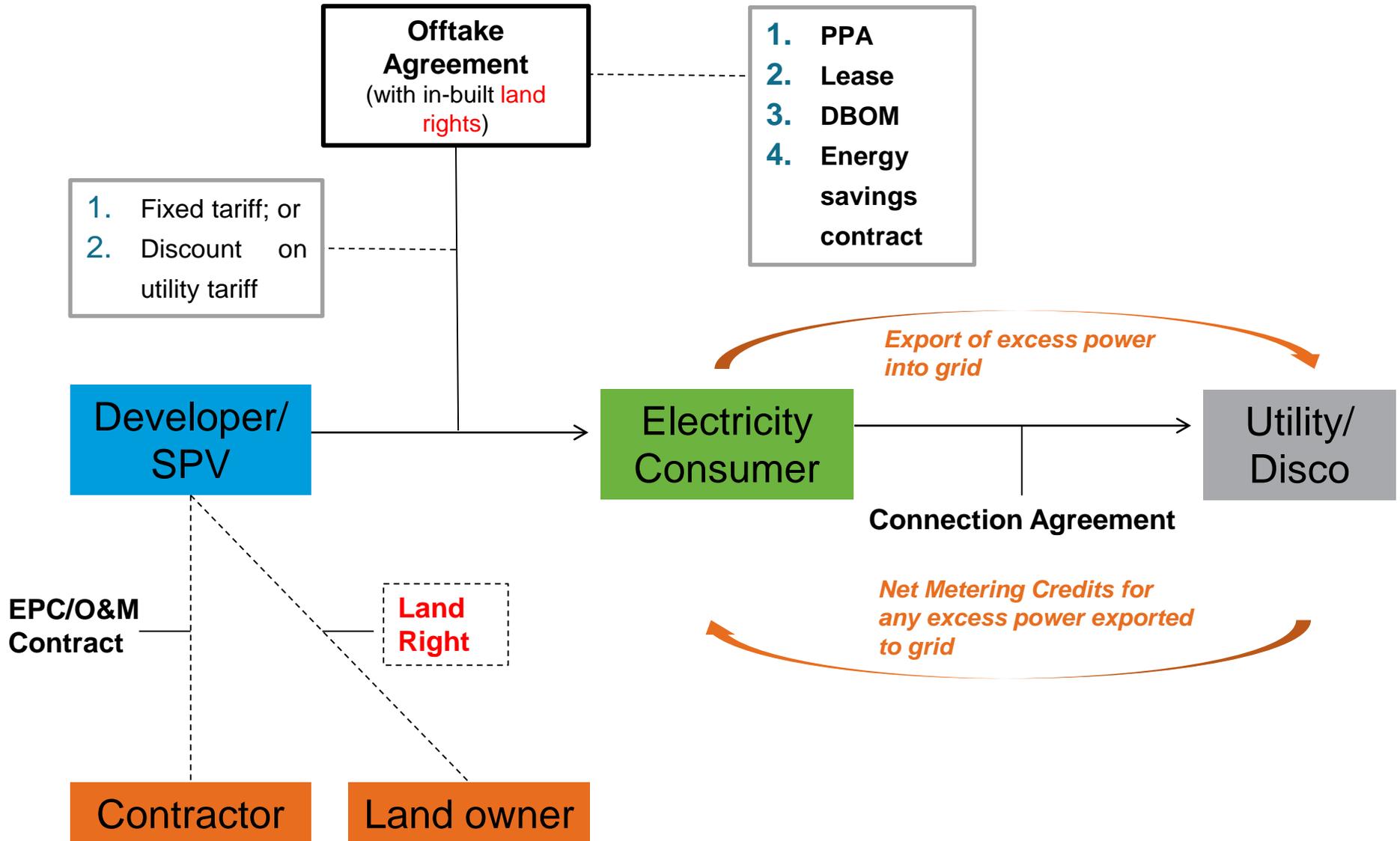
Emerging Business Models

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Emerging Business Models



Challenges

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Challenges

- **Electricity tariff subsidisation**

- Subsidies make certain DG solar segments unattractive to DG solar investors (e.g. low consuming residential)
- Cross-subsidization of electricity consumers makes some market segments less attractive to DG solar investors – but others very attractive (e.g. in Jordan: low consuming residential vs. banks).

If all the high paying electricity consumers start procuring their own electricity from solar -- and significantly reduce their consumption of grid electricity -- who is going to pay for the highly subsidised electricity consumers?

- **Government / Political Risk**

- Uncertainty of current regulations (e.g. wheeling with pooled offtakers in Jordan)
- Uncertainty on market type government wants (e.g. EPC vs. IPP)
- Conflict of interest of government, utilities and discos
- Political pressures → regulatory changes (e.g. fees / tariffs)

Challenges

- **Legal and Commercial Structuring**

- Structuring around the single buyer model
- Devising business models that fit within existing corporate licencing regimes -- or creating new ones (e.g. solar PV leasing activity code in Dubai)
- Regulatory uncertainties (e.g. PV system ownership; pooling)
- Offtaker deconsolidation requirements

- **Dealings With Offtakers**

- Non-structured tenders and time-consuming education process on risk allocation / bankability
- Expectation on pricing: last government solar tender price, but risk allocation that puts less risk on the offtaker
- Expectations on offtake agreement term
- Deconsolidation requirements – impact on payment security, minimum take requirements, etc.

Challenges

- **Financing**

- Projects under 15 MW unlikely to attract debt upfront. So, portfolio financing approach required whereby projects are first financed on balance sheet then refinanced as part of a portfolio. This means that significant equity is needed upfront
- Less favourable risk allocation from the perspective of the developer – e.g.:
 - challenge of obtaining long term offtake commitment
 - absence of sovereign guarantee – and difficulty in obtaining payment security
 - absence of direct agreement
 - reduced government force majeure-type protection

Lessons Learnt and Takeaways for Oman

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Lessons Learnt and Takeaways for Oman

- **Set a clear direction on type of DG solar market Oman wants**
 - Does Oman want an EPC only market? Or is it prepared to accept IPP-type companies operating in its DG solar market (and offering financing to potential power purchasers)?
 - Which market segments does Oman most want to develop?
 - residential / commercial / industrial
 - promotion of specific commercial / industrial sectors
 - Solar rooftop only – or also ground-mounted DG solar?
 - Do the current electricity tariff structures work for the purposes of achieving Oman's stated aims for solar rooftop / DG solar?

Lessons Learnt and Takeaways for Oman

Oman's "Permitted Tariffs" for Electricity Supply *

Permitted Tariff Category	Tariff Structure				
Industrial 1	All Regions except Dhofar			Dhofar Region	
	September to April: 12 Baiza per kWh			August to March: 12 Baiza per kWh	
	May to August: 24 Baiza per kWh			April to July: 24 Baiza per kWh	
Commercial	Flat rate @ 20 Baiza per kWh				
Ministry of Defence and the Sultan Special Forces	Flat rate @ 20 Baiza per kWh				
Residential	0-3000 kWh	3001-5000 kWh	5001-7000 kWh	7001-10000 kWh	above 10000 kWh
	10 Bz / kWh	15 Bz / kWh	20 Bz / kWh	25 Bz / kWh	30 Bz / kWh
Government	0-3000 kWh	3001-5000 kWh	5001-7000 kWh	7001-10000 kWh	above 10000 kWh
	10 Bz / kWh	15 Bz / kWh	20 Bz / kWh	25 Bz / kWh	30 Bz / kWh
Agriculture & Fisheries	0-7000 kWh			7001 kWh & above	
	10 Baiza per kWh			20 Baiza per kWh	
Tourism ²	0-3000 kWh	3001-5000 kWh	5001-7000 kWh	above 7001 kWh	
	10 Bz / kWh	15 Bz / kWh	20 Bz / kWh	20 Bz / kWh	

6.2 US\$ cents

5.2 US\$ cents

6.5 US\$ cents

7.8 US\$ cents

Demand Side Management

Consider more seasonal tariffs (e.g. commercial consumer)

Consider permitting / incentivising storage (e.g. in weak grid areas)

1 Customers require a MOCI letter of recommendation and must maintain a power factor of least 0.9

2 Subject to Ministry of Tourism regulations and approval

Lessons Learnt and Takeaways for Oman

- **Regulatory framework**

- Build on Oman's leading regulatory framework for electricity and water in the region
- But seek feedback from market participants on lessons learnt in other regional DG solar markets -- e.g.:
 - no generation licence required for DG solar projects – streamlined approvals process
 - clarity on how businesses should be structured and licenced
 - to address reluctance or inability of private offtakers to provide payment security, consider implementing an arrangement whereby the consumer will be cut off from the grid if it fails to pay the DG solar developer
- Issue clear laws and regulations – ideally with official translations in English
- Reduce scope for conflicts of interest. Try to get buy-in from local utilities / grid operators by providing opportunities for them to benefit from DG solar
- Avoid changing goal posts

Lessons Learnt and Takeaways for Oman

- **Educate and Train**

- Provide training sessions for electricity consumers on typical contract terms
- Involve local lenders and educate them on emerging business models and financing needs

- **Green bank or fund**

- Consider the establishment of a green bank or fund (which will understand Oman and DG solar) to provide attractive financing to market players

Lessons Learnt and Takeaways for Oman

- **Promote ease of doing DG solar business**

- Streamline time to obtain approvals, permits, and licences
- Consider establishing a solar unit (with English speaking capability) – and ideally try to structure things so that that the solar unit can coordinate and expedite administrative processes for developers with other government authorities
- Avoid processes that will significantly add to developer costs (e.g. inspection fees)
- Avoid, to the extent possible, requirements for translations, notarisations, and legalisations

- **Provide an innovation-friendly environment**

- In the next few years, expect to see a lot of innovation in the DG solar sector:
 - mobile phone payment technology
 - crowdfunding
 - Blockchain / crypto-currencies
- Give Oman and its citizens the means to participate in such innovations and reap their economic benefits



Thank you

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