Federal Ministry
for Economic Affairs
and Energy

# Solar Energy in Myanmar

## Pre-Assessment for Tourism and Buildings

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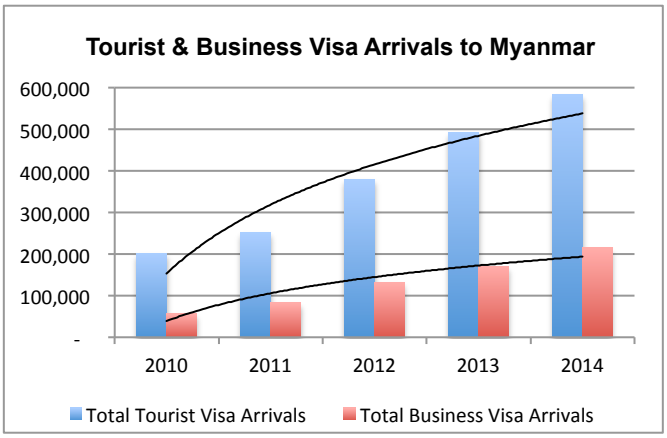
# Contents

# 1. Tourism in Myanmar

Since the political changes of 2011 Myanmar's tourism sector has seen considerable growth in international leisure and business arrivals, spurring a boom in the hotel and condominium construction industry. This, along with government Responsible Tourism policy presents a significant opportunity for the integration of solar technologies. The main zones for tourism development are the commercial capital of Yangon, the flagship sites of Bagan, Inle Lake and Mandalay, the administrative capital Nay Pyi Taw, as well as many other smaller emerging destinations. Yangon is the centre of hotel and condominium construction, with development booming countrywide. Tourism has seen double-digit growth since 2011 with total arrivals of all types exceeding 3 million in 2014.




### Tourist & Business Visa Arrivals

2014 saw 585,000 tourist visa and 215,000 business visa arrivals. Year on year growth peaked in 2012 at over 50%, with annual growth at 19% for tourist and 25% for business arrivals in 2014. The bulk of arrivals are cross-border visits from neighbouring countries.

## 1.1 The Hotel and Condominium Industry

To date there are a total of 1,186 hotels and guesthouses in Myanmar with a total of 46,690 rooms of all types and standards; Yangon has 306 hotels and 14,251 rooms. In 2013, 2,000 rooms were considered to be of "upmarket standard". Occupancy for the luxury segment increased from 45.8% in 2009 to a record 80% in 2013. Average daily rate (ADR) went up almost 300%, from US$40 in 2009 to a peak of $157 by the end of 2013, however revenue per available room has decreased by 22% in 2015. Since 2012, 48 new hotel projects have been approved in Yangon, of which 33 have been completed with the remainder to be launched before 2018. Foreign direct investment in the hotels and tourism sector in the country made up for 3.91%, or $2.21bn, of the total approved foreign direct investment in the first four months of 2015.

Countrywide, development is focused upon the high-end of the market. International hotel brands utilise franchise-operator arrangements and do not own buildings. Operators may not be involved during the construction process, unable to influence building infrastructure design. Large consortiums including Max Myanmar and the Htoo Group own many of Myanmar's larger hotels, typically owning the construction and finance companies.

Yangon is the centre of condominium development in Myanmar. 4,150 units were added in 2014, a 200% increase from 2012 at an average sale price of US$2,300 per square metre. Currently there are over 100 developments planned, with an estimated 20 projects due for completion by the end of 2015, adding 4-6,000 units. All condominiums (and hotels) are locally owned with a mix of local and international capital investment. Developments are often off-plan purchase: in 2013 80% of units were sold while in 2014 this fell to 68%.

Foreign-owned entities may not own land, apartments or any type of property in Myanmar under the current law, however it is possible to lease land from the state or private Myanmar Investors for 50 years, extendable by 10 years after. The new condominium law will pave the way for up to 40% foreign unit ownership in developments.

**Selected major new developments in Yangon**

| Project | Owner | Operator | Rooms | Completion |
|---|---|---|---|---|
| HAGL Gems Garden Project | Myanmar Capital Development | Melia Hotels | 400 | early 2016 |
| Novotel Yangon Max | Max Myanmar | Accor Group | 366 | early 2015 |
| Sedona Phase 2 | Keppel Land Hospitality | Sedona Hotels | 420 | late 2015 |
| Pullman Yangon Myat Min | Myat Min Co. Ltd | Accor Group | 300 | late 2015 |
| Daewoo Amara | South Korean Consortium | Daewoo Hotels | 661 | late 2016 |

### Thahara Pindaya: an off-grid B&B

Thahara Pindaya is a new concept of small hotel permitted under new B&B laws, that allow accommodation provision in properties of less than 10 rooms: the theme is a self-sustaining "eco" farmhouse. Owners have installed an Opai Solar PV system at a cost of approximately €13,000 from a Yangon-based company: they are mostly happy with the installation, however they require a back-up petrol generator during times of heavy cloud as current batteries are insufficient.

Nay Pyi Taw, Myanmar's administrative capital has 62 hotels with approximately 5,000 rooms. International brands include Accor, Kempinski and Hilton, operating management contracts. The market is effectively all business related travel, with average year-round occupancy as low as 15%. To utilise empty space, efforts are being made by the Ministry of Hotels and Tourism to market the city as a MICE (Meetings, Incentives, Conferences and Exhibitions) destination. No condominiums are planned at present. Nay Pyi Taw is unique in having 24-hour grid electricity, supplied mostly from the large Law Pyi Ta hydroelectric station.

Smaller Independent hotels are under construction throughout the country in both urban and rural areas. While many are similar architecturally to standard mid-range hotels across South-east Asia, some are being developed in the "boutique" style and are branding themselves as "ecolodges". Bed and Breakfast (B&B) properties are a new type of property permitted under Myanmar law: these are stand-alone properties with a maximum of 8 rooms, some developing as higher end facilities.

Inle Lake is Myanmar's flagship cultural and natural heritage tourism destination. As of 2014 there were 88 hotels in operation over the destination's centres of Nyaungshwe, Kalaw, Pindaya and Taunggyi, a total of 2,237 rooms, with at least 40 other properties under construction with an average of 25 rooms.

### Hotel Zones

Hotel development country-wide has been focused in "Hotel Zones". These are large designated areas that have had basic infrastructure developed solely for hotel construction. Construction began on the Inle Hotel Zone in 2012 and covers 252 hectares and plots for 87 properties. No additional power generation facilities have been included, though it is grid connected. To date only two hotels have been constructed.

Some emerging tourism destinations such as Keng Tung in eastern Shan State have approximately 3 hours daily connection during the dry season. With 22 hotels in operation and more under construction, Ngwe Saung, a popular beach destination west of Yangon is not grid connected and rely upon diesel generators.

## 1.2 Investment Decisions

Investment decisions are often speculative, spurred by the 50% growth of arrivals in the 2011-2 year and subsequent tripling of the average room rate. Hotels ownership is also seen as a status symbol.

# 2. Electricity Context

Approximately 33% of Myanmar's population has access to grid electricity, with on-grid areas subject to load-shedding, especially during the dry season when water levels in hydroelectric facilities fall. The Government of Myanmar has an ambitious target of universal electricity access by 2030. In Yangon and Mandalay supply is supplemented by temporary gas powered generators at high cost. During the 2015 hot season, Yangon achieved approximately 20-hour daily supply. Back-up generators are required for all facilities.

Grid electricity prices in Myanmar are fixed by government, with a new structure in place as of 1st April 2014. Cost of grid production is estimated at 100 MMK/kWh. In 2013 total installed capacity of Myanmar was 3734.9 MW, (10 times less than neighbouring Thailand) with 68% generated from hydropower: however due to limited reservoir size and lack of water, these systems can provide 30-40% of full potential. The Ministry of Electric Power has ambitious plans to increase installed capacity to 7,392 in 2020 and 24,981 MW by 2030.

## 2.1 Electricity Prices

### Example back-up diesel generator capital and operational costs for selected locations

| Hotel & Type | Location type | Typical units installed | Capital cost | Estimated annual operational costs |
|---|---|---|---|---|
| Aureum Palace Inle Lake: High end luxury c. 100 rooms | Major tourism destination, grid connected, generator required frequently during high tourist season | 2 x 315 kWh | €43,000 | €7,500 |
| View Point Hotel Nyaungshwe: Mid-level c. 30 rooms | Major tourism destination, grid connected, generator required occasionally during high tourist season | 1 x 80 kWh | €12,000 | €950 |
| Keng Tung Princess Hotel: Mid-level c. 30 rooms | Emerging tourism destination, local grid provides 4 hours per day during dry season. | 1 x 60 kWh<br>1 x 20 kWh | €8,500 | €1,525 |
| Hypothetical large hotel without grid connection c. 100 rooms | For example Chaung Tha, operating 6 hours per day for 5 months | **Diesel Generator equivalent at €0.31 per kWh** | | €17,485 |
| **Costs are based upon time of writing diesel costs of 170,000 MMK per 50 gallon barrel of diesel (749 MMK / €0.53 per litre equivalent)** | | | | |

### Grid Prices

| Household Consumption (monthly kWh) | Cost kWh |
|---|---|
| up to 100 | €0.0025 |
| 101 to 200 | €0.0029 |
| 201 and above | €0.0036 |
| **Commercial Consumption (monthly kWh)** | **Cost kWh** |
| up to 500 | €0.054 |
| 501 and above | €0.107 |
| *calculations based upon conversion rate of €1.00 = 1,400 MMK* | |

## 2.2 Options for Financing & Decision Making

Capital investment decisions are made by property owners, not managers. Building construction is often poor quality, with a focus on minimising capital expenditure with long-term operational costs secondary. Domestic investment corporations interested in tourism include Max Myanmar, Myanma Capita, Myat Min Company, Shwe Taung, Yoma Strategic Holdings, Htoo Group as well as most of the commercial banks. Financing options will depend upon property type and size:

### Consortium Owned

Larger hotels including national and international brands under management franchise: typically financed from large international consortiums or Myanmar investment groups. These may be linked to government.

### Large Locally Owned

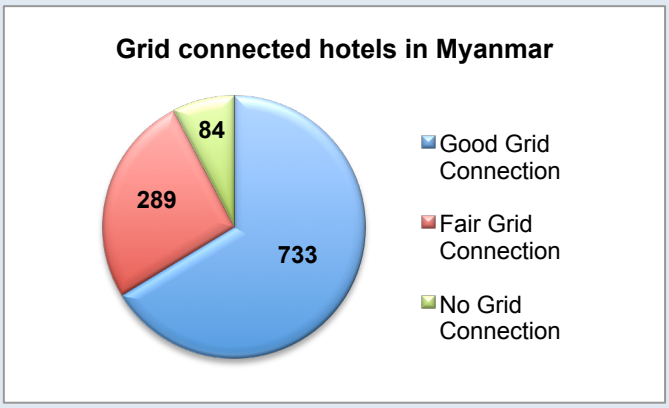
Typically higher market facilities, often "boutique" style: high level of management input from owners. Usually financed from family funds or groups of trusted friends/business partners.

### Small Locally Owned

Can include lower market guesthouses as well as smaller boutique facilities and B&Bs. Usually financed from family funds.

Bank financing through loans will likely grow rapidly with the development of the banking sector. A new Tourism Development Bank will open in late 2015 to support the growth of tourism related SMEs, with the tourism sector highlighted as a priority sector by international development agencies, especially at the SME level.

### Grid Connected Hotels




An estimated 8% of all hotels in Myanmar are not connected to the national grid and rely upon diesel generators: significantly this includes the beach resort towns of Chaung Tha, Ngwe Saung and Ngapali beaches, however government has pledges to connect these in 2016. Here "Good Connection" may be defined as Yangon and similar areas which have load shedding of up to 4 hours per day during the dry season; "Fair Connection" is defined as grid connected but suffering frequent load shedding all year and long periods without connection during the dry season.

## 2.3 Development Assistance

Development partner support for the electricity sector focuses upon rural electrification and improved grid connection at the macro level, with smaller scale support for village/home based mini-hydro and to a lesser extent solar. Rural electrification is a priority for the Government of Myanmar as is increasing electricity output that includes mini-grid and off-grid solutions. Main supporters include the World Bank and the ADB, with smaller local organisations supporting connection at village level.

The World Bank Electric Power Project provides US$1bn in long-term support for Myanmar's National Electrification Programme under the SEA4ALL (Sustainable Energy for All) initiative that could provide potential funding for mini-grid systems in rural areas. Likewise the ADB Off-Grid Renewable Energy Demonstration Project may be approached for support. Whilst there is no specific targeted support for the tourism industry, funding options may include DEG www.deginvest.de and EEP Mekong www.eepmekong.org. The Business Innovation Facility www.inclusivebusinesshub.org may support small businesses seeking to invest in solar. NGOs such as PACT and BHN support village based projects. Stronger cases could be made toward development partners if there were clear community development links to projects.

# 3. Critical motivations

Critically, capital costs and short payback period will be paramount for investment in solar power. Potential clients will need to be convinced that solar can offer a real alternative to back-up diesel generators: many potential stakeholders express concerns over reliability of solar, especially during rainy seasons, or the ability of systems to run heavy-loads such as air conditioners. In summary:

- Capital cost of systems: cost difference between renewable and conventional grid and off-grid solutions.
- Running costs of systems and potential savings: running costs less than conventional solutions.
- Guarantees of reliability during all seasons: working examples of successful projects.
- Short Pay Back Period of capital investment and justification of higher capital costs of German technology.
- Marketing for lower environmental impact of property.

## 3.1 In Summary

With a 33% grid coverage by population and abundant sunshine, Myanmar presents an attractive development potential for solar investment within the tourism industry. Although at a low level compared with neighbouring countries, tourism will continue to grow in Myanmar as will demand for improved housing. The impetus for hotel development is to focus on the high end and luxury markets throughout the country. New destinations are opening up often in areas of natural beauty, presenting an opportunity to use solar energy as an environmentally friendly marketing strategy. On a large scale, solar power is a relatively new technology in Myanmar. Whilst solar water heating has existed for some time, photovoltaic cells are mostly seen in low capacity rural home applications and thus realistic pilots would be required to develop market potential, preferably utilising visible market leaders. The main barrier would be to prove initial capital expenditure differences between conventional systems can be balanced quickly with reduced energy costs, plus demonstrations that technology is reliable.

## 3.2 Recommendations for Solar Energy Companies

- Contact property owners for investment decisions as opposed to managers or management companies.
- International chains offer an opportunity to promote sustainability criteria and can support implementation of solar projects.
- Focus promotion for solar on environmentally friendly marketing value.

## 3.3 Recommendations for Public Policy and Regulation Makers

- Myanmar's Responsible Tourism Policy places the country in a unique position to develop a truly sustainably tourism industry: solar power in hotels can offer excellent promotional value as well as solving energy issues
- Hotels and condominiums should be encouraged to use solar power through financial incentives such as tax relief.
- Opportunities for the hotel sector to support electrification in adjacent rural communities should be sought and encouraged.

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