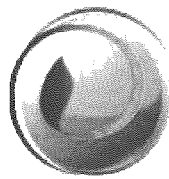


ENERGY SOLUTIONS INTERNATIONAL LTD  
SAMOAN REGISTRATION NO: (67886)

ARBN 604 543 777



Energy Solutions  
International Ltd.

## INFORMATION MEMORANDUM

IN RESPECT OF THE ISSUE OF 500,000 CDIs ISSUED AT US\$0.30 EACH FULLY PAID AND THE  
LISTING OF ENERGY SOLUTIONS INTERNATIONAL LTD ON THE  
NATIONAL STOCK EXCHANGE OF AUSTRALIA LIMITED

## **Important Notice**

This Information Memorandum is dated 5 June 2015.

An Application will be made to the National Stock Exchange of Australia Limited for admission of the Company to the Official List and quotation of the CDIs which are subject to this Information Memorandum. The fact that the National Stock Exchange of Australia Limited may list the securities of the Company is not to be taken in any way as an indication of the merits of the Company or the listed securities. The National Stock Exchange of Australia Limited takes no responsibility for the contents of this document, makes no representations as to its accuracy or completeness and expressly disclaims any liability whatsoever for any loss howsoever arising from or in reliance upon any part of the contents of this document.

No offer is made under this document to persons who are citizens or residents of Samoa or who are located in Australia. No applications will be accepted for securities offered under this document by persons who are citizens or residents of Samoa or who are located in Australia.

This document may not be distributed in the United States. This document does not constitute an offer to sell, or a solicitation of an offer to buy securities in the United States. Any securities described in this document have not been and will not be, registered under the US Securities Act 1993 and may not be offered or sold in the United States except in transactions exempt from, or not subject to, registration under the US Securities Act 1993 and applicable US state securities law.

The distribution of this Information Memorandum in other jurisdictions may be restricted by law and persons who come into possession of this Information Memorandum should seek advice on and observe any of these restrictions. Failure to comply with these restrictions may violate securities laws.

Applicants should consult their professional advisers as to whether any governmental or other consents are required or whether any other formalities need to be considered and followed.

This Information Memorandum does not constitute an offer in any place in which, or to any person to whom, it should not be lawful to make such an offer.

No person is authorized to provide any information or make any representation in connection with the Offer which is not contained in this Information Memorandum.

## **Suitability of Investment & Risks**

Before deciding to invest in the Company, prospective investors should read this Information Memorandum entirely and, in particular, the summary of the Company business in section 4 and the risk factors in section 5. They should carefully consider these factors in the light of their personal circumstances (including financial and taxation issues) and seek professional advice from their accountant, stockbroker, lawyer or other professional adviser before deciding to invest. Any investment in the CDIs of the Company should be regarded as speculative.

## **Definitions and Photographs**

Certain terms and abbreviations used in this Information Memorandum have defined meanings, which are explained in the Glossary. Any assets depicted in photographs in this Information Memorandum are not assets of the Company unless otherwise stated.

## DEFINITIONS AND GLOSSARY

**Applicant** means any person or entity applying for CDIs under this Offer.

**Application** means a valid application to subscribe for CDIs.

**Application Form** means an application form attached to and forming part of this Information Memorandum.

**Artoy Ltd means** Artoy Muzik Uretim Ve Yapimeilik Ticaret Ltd Serketi.

**Board** means the Board of Directors of the Company.

**CDN** means Chess Depository Nominees Pty Ltd ACN 071 346 506.

**CDI** means Chess Depository Instrument.

**CDI Holder** means a holder of a CDI.

**Closing Date** 17 June 2015

**Company or ESI** means Energy Solutions International Ltd a company registered under the ICA with Samoan registered no 67886, and registered as a foreign company in Australia with ARBN 604 543 777.

**Constitution** means the Memorandum and Articles of Association of the Company.

**Directors** means the Directors of the Company as at the date of this Information Memorandum.

**FSE** means the Frankfurt Stock Exchange.

**Hayat means** Hayat Alternatif Yeni Enerji Uretim Sanayi Ve Ticaret Anonim Serketi.

**ICA** means the International Companies Act 1987 (Samoa).

**Information Memorandum** means this document.

**Initial Holders** means the holders of all of the issued capital in the Company as at the date of this Information Memorandum.

**Listing Rules** means the Official Listing Rule of the NSX.

**NSX** means National Stock Exchange of Australia Ltd.

**Offer** means an invitation to make Applications in the terms of this Information Memorandum to acquire 500,000 CDIs for the Offer Price.

**Offer Price** means US\$0.30 per CDI.

**Official List** means the official list of the NSX.

**Share** means a fully paid ordinary Share in the capital of the Company.

**Share Register, Share Registry, Share Registrar or Share Registry** means Boardroom Pty Limited ACN 003 209 836.

**Shareholder** means a holder of a Share or CDI as the case may be.

**SME** means small to medium sized entity.

## **CORPORATE DIRECTORY**

### DIRECTORS

KHANDAKAR ABUL KASHAM REZBI - Chairman  
MATTHEW GARDINER – Managing Director

### SECRETARIES

WESTCO SECRETARIES LTD  
LEVEL 2 LOTEMAU CENTRE  
VAEA STREET  
APIA SAMOA

ANDREW BRISTOW - AUSTRALIA

### REGISTERED OFFICE – SAMOA

C/- ASIACITI TRUST SAMOA LTD  
LEVEL 2 LOTEMAU CENTRE  
VAEA STREET  
APIA SAMOA

### REGISTERED OFFICE – AUSTRALIA

c/- HIGHGATE CORPORATE ADVISORS PTY LTD  
31 HIGHGATE CCT  
KELLYVILLE NSW 2155  
(612) 96296772

### NOMINATED ADVISOR

HIGHGATE CORPORATE ADVISORS PTY LTD  
31 HIGHGATE CCT  
KELLYVILLE NSW 2155  
(612) 96296772

### AUDITOR

IQBAL YASIR & COMPANY  
CHARTERED ACCOUNTANTS  
RB-II, 2<sup>ND</sup> FLOOR,  
FLAT NO.15,  
AWAMI COMPLEX  
USMAN BLOCK, NEW GARDEN TOWN,  
LAHORE PAKISTAN  
(REGISTERED IN SAMOA)

### SHARE/SHARE REGISTRY

BOARDROOM PTY LIMITED  
LEVEL 7, 207 KENT STREET,  
SYDNEY NSW 2000

## 1. CHAIRMAN'S LETTER

Dear Investor

I invite you to become a Shareholder in Energy Solutions International Ltd.

ESI has recently been established to acquire a 66% interest in Hayat and to build investments in other renewable energy companies and projects.

Hayat holds a 49% stake in CW Energy which has over 12% of the solar energy market in Turkey. CW Energy was valued in 2014 at over Euro 100 million in 2014.

Hayat also has the right to develop 6 solar energy farms in Turkey in its own right. The Company has the option fund these projects in their entirety or to fund 66% of the costs of Hayat developing the projects.

The Company's Managing Director, Matthew Gardiner, has extensive experience in developing Solar Energy projects in Turkey. He is the Managing Director of Hayat.

Energy Solutions eventually plans to acquire further shareholdings in young companies and projects, which it can help to grow and expand, ideally with synergies from the already existing shareholdings.

The Group's initial operations are based in Turkey.

The Company intends to list its CDIs on the NSX and then in the near future list on the Frankfurt Stock Exchange where with access to European markets it will raise additional capital to make its initial investments.

As the Company is newly established Applicants for CDIs should understand that investment in ENERGY SOLUTIONS INTERNATIONAL LIMITED is inherently more speculative than an investment in a company carrying on an established business.

On behalf of the Directors, I invite you to consider this opportunity to participate in ESI's future. This Information Memorandum contains detailed information about the Offer and I encourage you to read it fully.

I look forward to welcoming you as a Shareholder.

Yours sincerely,

Chairman

## 2. DETAILS OF THE OFFER

### 2.1. Description of the offer

This Information Memorandum invites investors to apply for a total of 500,000 CDIs to raise an initial US\$150,000.

The Offer is for the issue of 500,000 CDIs at the Offer Price of US\$0.30 per CDI.

All CDIs offered under this Information Memorandum will rank equally with the existing CDIs already on issue in the Company, and entitle the holder to one vote per CDI held.

The 500,000 CDIs will represent 25% of the 2,000,000 issued CDIs in the Company at the completion of the Offer.

### 2.2. What are CDIs?

The Company is incorporated in Samoa which does not recognize the CHESS system of holding securities or electronic transfer of legal title to CDIs. To enable companies such as ESI to have their securities cleared and settled electronically through CHESS, depository interests called CHESS Depository Interests (CDIs) are issued. CDI holders receive all of the economic benefits of actual ownership of the underlying Shares. CDIs are traded in a manner similar to shares of Australian companies listed on the NSX.

CDIs will be held in uncertificated form and settled/transferred through CHESS. No share certificates will be issued to CDI Holders. Shareholders cannot trade their CDIs on NSX without first converting their Shares into CDIs.

Each CDI represents one underlying Share. The main difference between holding CDIs and Shares is that CDI holders hold the beneficial ownership in the Shares instead of the legal title. CDN, a subsidiary of the Australian Stock Exchange Limited (ASX), will hold the legal title to the underlying Shares. The Shares underlying the CDIs will be registered in the name of CDN and will be held on behalf of and for the benefit of the Shareholder. CDIs will be CHESS approved from the date of official quotation in accordance with the Listing Rules and the ASX Settlement Operating Rules. The Shares underlying the CDIs will rank equally with the Shares currently on issue in the Company. A summary of the key rights attaching to Shares and CDIs is set out under the headings "Rights and Obligations Attaching to Shares" and "Rights of CDI Holders" in Sections 7.4 and 7.5.

Shareholders can choose to have their CDIs converted to a direct holding of Shares, however, if they do so they will no longer be able to trade on NSX. Similarly, subject to any restrictions under applicable law, holders of Shares may choose to convert their Shares to CDIs to enable them to trade on NSX.

### 2.3. Purpose of the offer and use of proceeds

The key purposes of the Offer are:

- to pay the costs of listing the Company on the NSX;
- to broaden the Company's Shareholder base and improve liquidity;
- to allow the Company to achieve a listing on the FSE to provide access to European capital markets in order to strengthen the Company's balance sheet and fund investments in new investments as they arise;
- to provide additional working capital.

Once listed on the NSX the Company intends to seek to raise up to an additional US\$10,000,000 on the FSE for the following Group purposes:

	USD\$
Investment Activities	\$8,000,000
Costs of Capital Raising	\$500,000
Working Capital	\$1,500,000
Total	\$10,000,000

The Company anticipates these additional CDIs will be offered at a minimum of US\$1.00 each.

## 2.4. Ownership and Escrow

There are 1,500,000 fully paid CDIs on issue as at the date of this Information Memorandum. These CDIs were issued in consideration for the acquisition of 66% of Hayat from Artoy and the subscription by Khandakar Rezbi of a total of \$15,000 in seed capital to the Company. Details of the Hayat acquisition can be found in section 7.1.

The Initial Holders will at the time of listing on the NSX hold 75% of the CDIs in the Company and thereby control 75% of all votes in general meeting. As such, assuming full subscription under this Offer they will be in a position to pass ordinary resolutions, including resolutions to appoint or remove Directors and to pass special resolutions such as resolutions to amend the Constitution.

The Initial Holders also hold 800,000 "A" Converting Shares which were issued at US\$0.01 each which convert into Ordinary Shares on the raising of US\$30,000,000 of additional capital.

Artoy will hold 67.5% of the CDIs and as such be in a position in its own right to pass ordinary resolutions and prevent the passage of special resolutions.

Khandakar Rezbi who is a director will hold 7.5% of the CDIs on listing on the NSX. While Mr Rezbi will be a substantial Shareholder as he holds more than 5% of the CDIs, he will not on his own be able to prevent the passage of any resolution.

It is expected that between 50% and 100% the CDIs held by Artoy and Mr Rezbi will be subject to escrow for up to 24 months after quotation as determined by the NSX. It is expected that all "A" Class Converting Shares shall also be subject to escrow for two years from listing.

The ownership structure of the Company at completion of this Offer will be as follows:

	CDIs	"A" Class Converting
Currently on issue	1,500,000	800,000
CDIs under this Offer	500,000	
Total on issue following the Offer	2,000,000	800,000
Full amount to be raised under the Offer	US\$150,000	
Offer Price per CDI	US\$0.30	

## 2.5. Timetable of the offer

Opening Date of the Offer <sup>1</sup>	5 June 2015
Closing Date of the Offer <sup>2</sup>	17 June 2015
Allotment of CDIs under this Information Memorandum	22 June 2015
Quotation of CDIs on the NSX	1 July 2015

1.The Company reserves the right to close the Offer early or later as indicated above without prior notice.

2.The Company reserves the right to alter any of the dates relating to the Offer without notice. Investors are encouraged to submit their Applications as soon as possible after the opening of the Offer.

## **2.6. Applications**

An Application Form may only be distributed with, attached to, or accompany a complete and unaltered copy of this Information Memorandum. Application Forms included with or accompanying this Information Memorandum contain a declaration that the investor has personally received the complete and unaltered Information Memorandum prior to completing the Application Form.

The Company will not accept a completed Application Form if it has reason to believe that the Applicant has not received a complete copy of this Information Memorandum or if it has reason to believe that the Application Form has been altered or tampered with in any way.



### 3. ANSWERS TO KEY QUESTIONS

Question	Response	Where to find more information
Who is issuing this Information Memorandum?	Energy Solutions International Ltd Samoan Registered Number 67886.	Section 4
Who is Energy Solutions International Ltd and what does it do?	<p>Energy Solutions International Ltd was incorporated on 27 January 2015 under the Samoan International Companies Act, 1987.</p> <p>ESI is a company which will specialise in investing in companies that are active in the field of renewable energy. Its initial investment is a holding of 66% in Hayat.</p> <p>Hayat holds 49% of CW Energy a major solar electricity generator in Turkey. Hayat also has the right to develop 6 solar farms in Turkey. ESI has the right to finance 100% of any or all of these solar farms in its own right or to fund 66% of Hayat's costs of developing the projects.</p>	Sections 4.4 and 4.5
What is the Offer?	The Offer is for the issue of 500,000 CDIs in the Company. The CDIs will represent 25% of the CDIs in ESI and will be 25% of the securities listed on NSX immediately following completion of the Offer.	Section 2.1
What is the Offer Price?	US\$0.30 per CDI	Section 2.2
What is the number of CDIs on issue?	Prior to the Offer, there were 1,500,000 CDIs on issue. The Company intends to apply to the NSX for 2,000,000 CDIs to be quoted on the Official List of the NSX.	Section 2.3
Who can invest?	The Offer is only open to eligible investors and is not made to citizens or residents of Samoa, residents of Australia or the United States of America.	
Is the Offer underwritten?	No.	
What are the benefits of investing in the Company?	<p>The benefits of investing in the Company include the following:</p> <ul style="list-style-type: none"> <li>• Initial holding of an indirect interest in 32% of CW Energy which has been valued at over Euro 100 million.</li> <li>• Hayat, the Company's 66% subsidiary has right to develop 6 new solar energy farms in Turkey.</li> <li>• Company can acquire 100% of any or all of the solar farms that Hayat can develop or elect to fund 66% of the costs of each development.</li> </ul>	Section 4

What are the key risks of investing in the Company?	<p>The key risks of investing in the Company include:</p> <ul style="list-style-type: none"> <li>• Lack of investment opportunities</li> <li>• Investment in the renewable energy sector are often uncertain and more risky than investing in listed securities or government debt securities.</li> <li>• Foreign exchange risk as investments in multiple countries.</li> <li>• Regulatory and political risk.</li> </ul>	Section 5
What is the financial position of the Company?	<p>ESI was only established on 27 January 2015. Since it was established the Company raised initial seed capital of \$23,000 and has not otherwise traded. The Company seeks to raise \$150,000 from its offer and to seek a dual listing on the Frankfurt Stock Exchange in order to attract additional capital in the European markets. The Company believes \$150,000 is sufficient to allow it to achieve its initial goals in listing on NSX and FSE and to have sufficient capital for the foreseeable future.</p>	
Who are the Directors of the Company?	<p>The Directors of the Company are:</p> <p>Khandakar Abul Kasham Rezbi – Chairman Matthew Gardiner- Managing Director</p>	Section 4.6
How will the proceeds of the Offer be used?	<p>The Company intends to use its funds and the funds raised from the Offer to pay the costs of listing the Company's CDIs on the NSX and then dual listing on the FSE as well as for working capital. The Company will seek up to US\$ 10,000,000 after listing on FSE to fund the 6 Solar energy projects to which Hayat has the development rights. The Company may elect to acquire a 100% financial interest in any of these projects or elect to contribute 66% of the costs with the balance to be invested by Hayat's other shareholders.</p>	Section 1.2
Will the Company pay dividends?	<p>The Company's focus will be on generating capital growth and has no immediate plan to declare or distribute dividends.</p>	
Where will the CDIs be quoted?	<p>An application will be made to the NSX. The Company intends to dual list on FSE after listing on NSX.</p>	
How can I obtain further advice?	<p>By speaking to your accountant, stockbroker or other professional advisor.</p>	

## **4. PROFILE OF ENERGY SOLUTIONS INTERNATIONAL**

### **4.1. Overview**

Energy Solutions was incorporated on 15 January 2015 under the Samoan International Companies Act, 1987. The Company is registered as a foreign company in Australia to facilitate its listing on NSX and its ARBN is 604 543 777.

ESI has recently been established to acquire a 66% interest in Hayat and to build investments in other renewable energy companies and projects.

Hayat holds a 49% stake in CW Energy which has over 12% of the solar energy market in Turkey. CW Energy was valued in 2014 at over Euro 100 million. A copy of the valuation is attached as Annexure "A".

Hayat also has the right to develop 6 solar energy farms in Turkey in its own right. The Company has the option fund these projects in their entirety or to fund 66% of the costs or Hayat developing the projects. Details of the option agreement between the Company and Hayat are set out in Section 7.1.

The Company's Managing Director, Matthew Gardiner, has extensive experience in developing Solar Energy projects in Turkey. He is the managing director of Hayat. The management structures of Hayat and CW Energy have not changed with the Company's acquisition of its interest in Hayat.

Energy Solutions eventually plans to acquire further shareholdings in young companies and projects, which it can help to grow and expand, ideally with synergies from the already existing shareholdings.

The primary investment objective of the Company is to develop as an aggressive investment and transaction oriented business focused on wealth creation for its Shareholders. Other than the investment in Hayat and the proposed solar energy farms, the main investment activities of the Company are expected to focus on renewable energy companies, numerous energy projects and technologies that are suitable for future listing on recognised stock exchanges and may require further working capital, development assistance and/or management to realize their respective potential. To avoid any adverse impact on the Company from any single or individual investment loss, the Company proposes to invest in a number of solar energy and other renewable business developments and security interests in diverse global jurisdictions.

The Company's underlying investment philosophy, investment strategy and assessment criteria are set out in more detail in Section 4.2 of this Information Memorandum.

## **4.2. Investment Objective**

The Company's investment objective is to achieve above market returns for its Shareholders from its investment activities.

The major investment thrust of the Company will be in the renewable energy sector particularly where an investment offers synergistic benefits to other investments. The initial investments will be located in Turkey and will either be through Hayat or wholly owned by the Company.

Generally, ESI will seek to retain and hold between 15% and 35% of the post – IPO Share capital of each company it invests in.

Should any assets be otherwise realised, for either cash and/or CDIs, then a percentage of any net proceeds of such realisation may be distributed proportionately to the Company's Shareholders, at the discretion of the Company and also subject to compliance with the ICA and the Listing Rules.

## **Investment Strategy**

The Company's major investment initiatives encompass the following key strategic objectives:

- Investments focused on renewable energy companies and projects with the initial investments to be in Turkish Solar assets.
- Significant positions usually 50% or more pre -IPO will be sought in project candidates.
- Generally investment projects will be structured with an identified short to medium term exit strategy through a public listing on a stock exchange.
- Alternative exit strategies that may be considered such as sale, joint venture or similar within an 18 to 36 month target time frame.
- Focus on synergistic investment opportunities.
- The Company will seek to significantly value add each investment project within a target 3 to 12 month time frame from acquisition or participation.
- The Company intends to retain a substantial interest of all projects as an investment interest, which will generally comprise 15% to 35% of the post - IPO listed CDIs of the company invested in.

## **4.3. Turkish Renewable Energy Sector:**

ESI will initially invest in the renewable energy market in Turkey. The Turkish renewable energy sector can be described as follows:

The market for renewable energy in Turkey is in its infancy. Turkey is one of the fastest growing economies in Europe and has a growing need for electric power, growing at 6% per year. Most of the energy sources derive from oil and gas, which is being imported, mainly from Russia or former CIS-states. Turkey itself mainly produces electricity with coal, water and nuclear power and is focused on expanding the percentage of renewable energy within its scope of energy sources. Although Turkey has almost all kinds of energy resources, it is an energy importing country, since these resources are limited. More than half of the primary energy consumption in the country is met by imports, and the share of imports continues to increase each year.<sup>1</sup>

In order to meet the growing demand for electricity (which rises 6% annually), the country would need new power plants with a capacity of 29 GW by 2021 while also replacing outdated plants with a generating capacity of 20 GW, said Matthias Kittler. The political desire for greater independence from Russian and Iranian gas imports coupled with a sharp fall in prices of photovoltaic systems offer enormous opportunities for solar power in Turkey.<sup>2</sup>

With its high intensity of solar exposure, Turkey is an ideal location for the production of solar energy. Turkey lies in a sunny belt between 36° and 42° latitudes. The yearly average solar radiation is 3.6 kW h/m<sup>2</sup> day, and the total yearly radiation period is approximately 2640h, which is sufficient to provide adequate energy for solar thermal applications.<sup>3</sup> The state of Turkey has the intention to push solar energy as one more important energy source for Turkey and has therefore launched subsidy programs to motivate the building of solar energy plants.

Turkey's geographic location has several advantages for extensive use of most of the renewable energy sources. It is on a humid and warm climatic belt, which includes most of Europe, the near east and western Asia. A typical Mediterranean climate is predominant at most of its coastal areas, whereas the climate at the interior part between the mountains that are a part of the Alpine-Himalayan mountain belt is dry with typical steppe vegetation. This is mainly because the country is surrounded by seas at three sides: the Black sea at the north, the Marmara Sea and the Aegean Sea at the west and the Mediterranean Sea to the south.<sup>4</sup>

Sun Hours per year in Turkey:

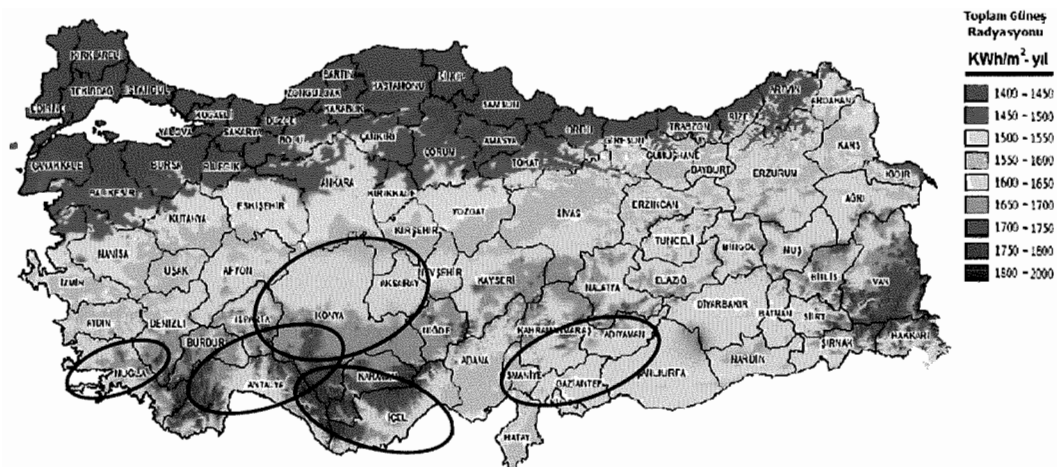
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<sup>1</sup> Kaygusuz/Sari, Renewable energy potential and utilization in Turkey“, Energy Conversion and Management 44 (2003) 459-478, 461.

<sup>2</sup> Neidlein, Turkey: Commercial rooftop systems prove an interesting market“, pv-magazine.com; June 16, 2013, downloaded August 06, 2013.

<sup>3</sup> Kaygusuz/Sari, „Renewable energy potential and utilization in Turkey“, Energy Conversion and Management 44 (2003) 459-478, 470; Deloitte, Turkish Environmental Technologies & Renewable Energy Industry Report“ August 2010; downloaded August 06, 2013, page 18;

<sup>4</sup> Kaygusuz/Sari, Renewable energy potential and utilization in Turkey“, Energy Conversion and Management 44 (2003) 459-478, 460.



(Source: IEA, PVPS Annual Report 2008)

Turkey is one of the most promising new photovoltaic markets. By 2020, the country expects an additional 4 to 6 GW (GigaWatt) to be installed. Funding and bureaucracy, however, remain obstacles. For the moment, short-term investments in commercial rooftop systems for self-consumption with a power rating of up to 1 MW (MegaWatt) offer the best opportunities.<sup>5</sup>

“The growing energy demand of the country’s booming economy and the high electricity prices are the main drivers behind Turkey’s PV market”, stressed Matthias Kittler from consulting firm Apricum. Currently a kilowatt hour of electricity costs around \$0.14 (TRY 26) for the industrial sector and \$0.16 (TRY 32) for private households. Electricity prices have increased an average of 11% a year since 2006.<sup>6</sup>

“The interest in photovoltaic is growing rapidly”, said Kittler. The time is now ripe for solar power in Turkey to grow beyond its niche. Indeed by the end of 2012, Turkey had less than 10 MW of installed photovoltaic systems. Kittler expects the number of PV systems in the country to double annually through 2020, an increase of installed capacity between 500 and 800 MW in 2015 and a rise of between 3.8 and 6.5 GW by 2020. He also sees average solar electricity production costs of less than \$0.15 per kilowatt hour as achievable. Commercial rooftop systems of up to 1 MW and ground-mounted facilities of more than 1 MW are the country’s main growth areas.<sup>7</sup>

The first licensing round for solar projects larger than 1 MW in Turkey was exceeded by almost 15 times. Nearly 500 applications with a total 8.9 GW were handed in between

<sup>5</sup> Neidlein, Turkey: Commercial rooftop systems prove an interesting market“, pv-magazine.com; June 16, 2013, downloaded August 06, 2013.

<sup>6</sup> Neidlein, Turkey: Commercial rooftop systems prove an interesting market“, pv-magazine.com; June 16, 2013, downloaded August 06, 2013.

<sup>7</sup> Neidlein, Turkey: Commercial rooftop systems prove an interesting market“, pv-magazine.com; June 16, 2013, downloaded August 06, 2013.

June 10 and 14, 2013.<sup>8 9</sup>

Only projects with a maximum capacity of 600 MW may be applied for at this point of time.<sup>10</sup>

While Turkey has attracted a great deal of attention from the international solar industry, most of the investors that submitted applications are Turkish.<sup>11</sup>

#### 4.4. Hayat and its Solar Projects

Hayat Alternatif Yeni Enerji Uretim Sanayi Ve Ticaret Anonim Serketi registered in Istanbul trade register with management address at Istanbul Bakirkoy Yesilkoy Dunya Ticaret Merkezi EGS, Business Park, BI BI, No:58, Istanbul , Turkey.

The company has a registered capital of 2,000,000 TRY distributed in 2,000,000 shares of nominal value of 1.00 TRY each. Owners of the capital are:

SHAREHOLDER NAME AND SURNAME NATIONALITY AND RESIDENCE ADDRESS	CAPITAL AMOUNT/TL	SHARE NUMBER
<b>AYTEKİN TOY</b> ACARLAR MAH. 41.SK.ACARKENT SİT. B 418 BLOK 3 İÇ KAPI NO:2 BEYKOZ/İSTANBUL	100.000,00	100.000
<b>ARTOY INTERNATIONAL MÜZİK ÜRETİM VE YAPIMCILIK TİCARET LTD SERKETİ</b>	480.000,00	480.000
<b>TİC.LTD.ŞTİ</b> YEŞİLKÖY DÜNYA TİC.MERKEZİ EGS BUSİNESS PARK B3 BLK K:2 N:144 BAKIRKÖY/İSTANBUL		
<b>ENERGY SOLUTIONS INTERNATIONAL LTD.</b> C/-ASIACITI TRUST SAMOA LTD LEVEL 2 LOTEMAU CENTRE VAEA STREET APIA SAMOA	1.320.000,00	1.320.000

<sup>8</sup> Neidlein/Meza, "Almost 9GW of projects submitted for licensing in Turkey", pv-magazine.com; June 17, 2013, downloaded August 06, 2013.

<sup>9</sup> Year 2013 has been added by the author of this Information Memorandum

<sup>10</sup> Neidlein/Meza, "Almost 9GW of projects submitted for licensing in Turkey", pv-magazine.com; June 17, 2013, downloaded August 06, 2013.

<sup>11</sup> Neidlein/Meza, "Almost 9GW of projects submitted for licensing in Turkey", pv-magazine.com; June 17, 2013, downloaded August 06, 2013.

<b>MATTHEW JOHN GARDINER</b> ÇENGELKÖY MH.BAKIRCIBAŞI SK. NO:10/12 ÜSKÜDAR/İSTANBUL	100.000,00	100.000
	<b>TOTAL 2.000.000,00</b>	<b>2.000.000</b>

The primarily objectives and activity fields of the company are as follows:

- A) To build electric power plant and every kind of alternative energy power plants; to assemble, commission, lease, producing energy, sales of produced energy and/or capacity to the clients; to deal with every kind of solid, liquid and gas fuel trade. The Company may deal with following points subject to Energy Market Legislation to realize its above mentioned objectives. To establish, commission, alienate, lease, rent every kind of plant to produce electric power; to sell produced electric energy and/or capacity to the legal entities holder of whole sales license and freelance consumers through mutual contracts; To make cooperation with the established or will be established distributing companies without composing control; to make joint venture relations with established electric energy producing companies.
- B) The company may perform every kind of petroleum, gas, mine and underground sources searching, analyzing and excavation works and mining activities with condition of getting required permissions. It may perform operating of those mines and underground resources. It may purchase, sell, lease, rent the mines. It may process extracted mines; it may sell them as raw or finished products; it may export or import. It may establish plants to process the mines. It may purchase, sell, import and export required machines and equipment to process the mines. It may attend to the state bids for searching and extracting every kind of mines. It may apply for every kind of mine areas licenses; it may assign or transfer them.

Hayat holds 49% of CW Energy which is a major solar energy company in Turkey (See Section 4.5 below)

Hayat has the right to develop up to 6 Solar Energy Farms in Turkey. Hayat has agreed that the Company may elect to either fund its proportional interest in the projects (ie. 66%) or it may acquire a 100% interest in any and all of the projects. Matthew Gardiner is responsible for overseeing completion of these projects.

The projects are set out below:



## **PROJECT 001:**

### **1. Project Summary**

<b>PROJECT 001 LAND PV PLANT</b>	
<b>Location</b>	<b>ANTALYA/KORKUTELİ-</b> Arazi 37° 9'41.76"K ve 30°16'50.84"E
<b>Landowner</b>	
<b>Land Area</b>	16.000 m <sup>2</sup>
<b>Plant Type</b>	LAND
<b>Project Situation</b>	Project Specification and Simulation was prepared.
<b>Legislation</b>	Unlicensed Production Regulation and the Renewable Energy Law
<b>TECHNICAL SPECIFICATIONS</b>	
<b>Installed Power</b>	1.000 kWp
<b>Irradiation, 30</b>	1.667 kWh / kWp annual
<b>Annual Energy Production</b>	ca. 1.667.561 kWh annual
<b>CO2 Emission Reduction</b>	~1.477.051 kg annual
<b>Number of Photovoltaic Modules</b>	4.000 PCS
<b>Area of Photovoltaic Modules</b>	6.494,40 m <sup>2</sup>
<b>Photovoltaic Modules Type</b>	CW Enerji Telefonken Semiconductors Type: CWT-250-60P/250Wp
<b>Inverter</b>	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10-OUTD-FS
<b>Under construction</b>	Steel Alloyed Carrier
<b>Additional Specifications</b>	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
<b>Investment</b>	1.000.000 € + VAT
<b>Revenue</b>	160.100 € /a & For 10 year 38.000 € INVESTMENT INCENTIVES
<b>Return Of Invest</b>	6,4 YEAR
<b>Operation</b>	FEED IN TARIFF(0,133 \$/kW)



**Arazi 37° 9'41.76"K ve 30°16'50.84"E**

<b>INVESTMENT BENEFITS</b>	
<b>VAT EXEMPTION</b>	<b>AVAILABLE</b>
<b>INVESTMENT INCENTIVES</b>	<b>AVAILABLE</b>
<b>TARIFF APPLICATION STATUS</b>	<b>0,133 \$/kW CONNECTION CALL LETTER AGREEMENT</b>

## PROJECT 002:

### 2. Project Summary



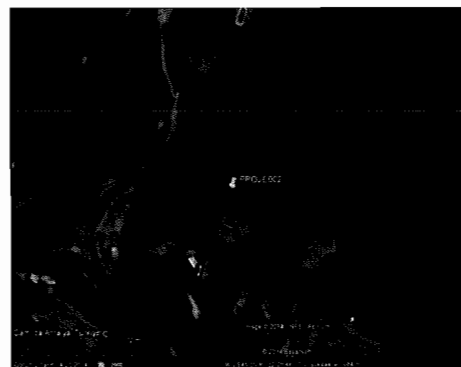
Energy Solutions  
International Ltd.

#### PROJECT 002 LAND PV PLANT

Location	ANTALYA/GAZİPAŞA
	Arazi 36°23'45.25"N ve 32°25'41.51"E
Landowner	
Land Area	16.000 m <sup>2</sup>
Plant Type	LAND
Project Situation	Project Specification and Simulation was prepared.
Legislation	Unlicensed Production Regulation and the Renewable Energy Law

#### TECHNICAL SPECIFICATIONS

Installed Power	1.000 kWp
Irradiation, 30	1.610 kWh / kWp annual
Annual Energy Production	ca. 1.610.082 kWh annual
CO2 Emission Reduction	~1.422.126 kg annual
Number of Photovoltaic Modules	4.000 PCS
Area of Photovoltaic Modules	6.494,40 m <sup>2</sup>
Photovoltaic Modules Type	CW Enerji Telefonken Semiconductors Type: CWT-250-60P/250Wp
Inverter	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10-OUTD-FS
Under construction	Steel Alloyed Carrier
Additional Specifications	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
Investment	980.000 € + VAT
Revenue	156.379 € /a & For 10 year 38.000 € INVESTMENT INCENTIVES
Return Of Invest	6,3 YEAR
Operation	FEED IN TARIFF(0,133 \$/kW)



Arazi 37° 9'41.76"N ve 30°16'50.84"E

#### INVESTMENT BENEFITS

VAT EXEMPTION	AVAILABLE
INVESTMENT INCENTIVES	AVAILABLE
TARIFF APPLICATION STATUS	0,133 \$/kW CONNECTION CALL LETTER AGREEMENT

## PROJECT 003:

### 3. Project Summary



Energy Solutions  
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PROJECT 003 LAND PV PLANT	
Location	ANTALYA/ELMALI Arazi 36°38'57.33"K ve 29°50'20.17"E
Landowner	
Land Area	16.000 m <sup>2</sup>
Plant Type	LAND
Project Situation	Project Specification and Simulation was prepared.
Legislation	Unlicensed Production Regulation and the Renewable Energy Law
TECHNICAL SPECIFICATIONS	
Installed Power	1.000 kWp
Irradiation, 30	1.683 kWh / kWp annual
Annual Energy Production	1.683.033 kWh annual
CO2 Emission Reduction	~1.452.612 kg annual
Number of Photovoltaic Modules	4.000 PCS
Area of Photovoltaic Modules	6.494,40 m <sup>2</sup>
Photovoltaic Modules Type	CW Enerji Telefonken Semiconductors Type: CWT-250-60P/250Wp
Inverter	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10-OUTD-FS
Under construction	Steel Alloyed Carrier
Additional Specifications	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
Investment	950.000 € + VAT
Revenue	158.565 € / a & For 10 YEAR 38.000 € INVESTMENT INCENTIVES
Return Of Invest	6 YEAR
Operation	FEED IN TARIFF(0,133 \$/kW)



Arazi 37° 9'41.76"K ve 30°16'50.84"E

INVESTMENT BENEFITS	
VAT EXEMPTION	AVAILABLE
INVESTMENT INCENTIVES	AVAILABLE
TARIFF	0,133 \$/kW
APPLICATION STATUS	CONNECTION CALL LETTER AGREEMENT

## PROJECT 004:

### 4. Project Summary



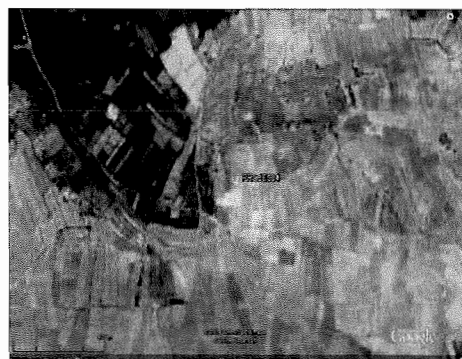
Energy Solutions  
International Ltd.

#### PROJECT 004 LAND PV PLANT

Location	ISPARTA LAND 37°49'8.37"K ve 30°54'58.5"E
Landowner	
Land Area	16.000 m <sup>2</sup>
Plant Type	LAND
Project Situation	Project Specification and Simulation was prepared.
Legislation	Unlicensed Production Regulation and the Renewable Energy Law

#### TECHNICAL SPECIFICATIONS

Installed Power	1.000 kWp
Irradiation, 30	1.645 kWh / kWp annual
Annual Energy Production	ca. 1.645.375 kWh annual
CO2 Emission Reduction	~1.457.394 kg annual
Number of Photovoltaic Modules	4.000 PCS
Area of Photovoltaic Modules	6.494,40 m <sup>2</sup>
Photovoltaic Modules Type	CW Enerji Telefunken Semiconductors Type: CWT-250-60P/250Wp
Inverter	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10- OUTD-FS
Under construction	Steel Alloyed Carrier
Additional Specifications	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
Investment	1.000.000 € + VAT
Revenue	158.016 € /a & For 10 year 38.000 € INVESTMENT INCENTIVES
Return Of Invest	6,5 YEAR
Operation	FEED IN TARIFF(0,133 \$/kW)



Arazi 37° 9'41.76"K ve 30°16'50.84"E

#### INVESTMENT BENEFITS

VAT EXEMPTION	AVAILABLE
INVESTMENT INCENTIVES	AVAILABLE
TARIFF	0,133 \$/kW
APPLICATION STATUS	CONNECTION CALL LETTER AGREEMENT

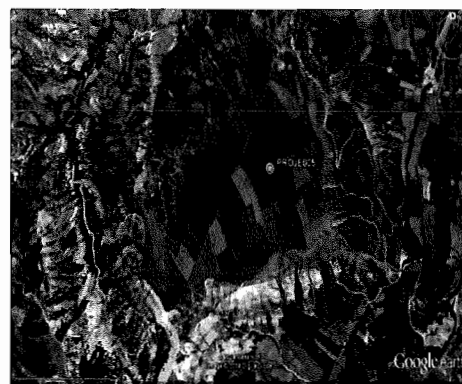
## PROJECT 005:



Energy Solutions  
International Ltd.

### 5. Project Summary

PROJECT 005 LAND PV PLANT	
Location	BURDUR 37°35'54.24"K ve 30°16'1.90"E
Landowner	
Land Area	16.000 m <sup>2</sup>
Plant Type	LAND
Project Situation	Project Specification and Simulation was prepared.
Legislation	Unlicensed Production Regulation and the Renewable Energy Law
TECHNICAL SPECIFICATIONS	
Installed Power	1.000 kWp
Irradiation, 30	1.651 kWh / kWp annual
Annual Energy Production	ca. 1.651.723 kWh annual
CO2 Emission Reduction	~1.485.654 kg annual
Number of Photovoltaic Modules	4.000 PCS
Area of Photovoltaic Modules	6.494,40 m <sup>2</sup>
Photovoltaic Modules Type	CW Enerji Telefunken Semiconductors Type: CWT-250-60P/250Wp
Inverter	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10-OUTD-FS
Under construction	Steel Alloyed Carrier
Additional Specifications	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
Investment	1.050.000 € + VAT
Revenue	160.100 € /a & For 10 year 38.000 € INVESTMENT INCENTIVES
Return Of Invest	6,8 YEAR
Operation	FEED IN TARIFF(0,133 \$/kW)



Arazi 37° 9'41.76"K ve 30°16'50.84"E

INVESTMENT BENEFITS	
VAT EXEMPTION	AVAILABLE
INVESTMENT INCENTIVES	AVAILABLE
TARIFF	0,133 \$/kW
APPLICATION STATUS	CONNECTION CALL LETTER AGREEMENT

## PROJECT 006:

### 6. Project Summary



#### PROJECT 006 LAND PV PLANT

Location	MANAVGAT 36°52'40.53"K ve 31°19'39.81"E
Landowner	
Land Area	16.000 m <sup>2</sup>
Plant Type	LAND
Project Situation	Project Specification and Simulation was prepared.
Legislation	Unlicensed Production Regulation and the Renewable Energy Law

#### TECHNICAL SPECIFICATIONS

Installed Power	1.000 kWp
Irradiation, 30	1.666 kWh / kWp annual
Annual Energy Production	ca. 1.666.145 kWh annual
CO2 Emission Reduction	~1.494.789 kg annual
Number of Photovoltaic Modules	4.000 PCS
Area of Photovoltaic Modules	6.494,40 m <sup>2</sup>
Photovoltaic Modules Type	CW Enerji Telefunken Semiconductors Type: CWT-250-60P/250Wp
Inverter	33 PCS Inverter Power-One Trio 27,6-TL-OUTDS2F 1 PCS Inverter Power-One PVI-10-OUTD-FS
Under construction	Steel Alloyed Carrier
Additional Specifications	Remote Data monitoring, Alarm System, CCTV Camera, Daily Control
Investment	1.100.000 € + VAT
Revenue	159.949,92 € /a & For 10 year 38.000 € INVESTMENT INCENTIVES
Return Of Invest	7,1 YEAR
Operation	FEED IN TARIFF(0,133 \$/kW)



Arazi 37° 9'41.76"K ve 30°16'50.84"E

#### INVESTMENT BENEFITS

VAT EXEMPTION	AVAILABLE
INVESTMENT INCENTIVES	AVAILABLE
TARIFF APPLICATION STATUS	0,133 \$/kW CONNECTION CALL LETTER AGREEMENT

#### 4.5. CW Energy

CW ENERJI VE TICARET SANAYI LTD (CW Enerji Ltd) is a limited liability company, registered in the Trade Register in Antalya, with management address Mahallesi, Kuskavagi Caddesi, No 42/A Konyaalti/Antalya.

The objects of CW Energy are: construction of solar power plants and on – grid and off-grid hybrid renewable installations in terms of assigned projects including a turnkey servicing in the field of design, engineering, procurement, assembly and completion of PV systems, installation and putting into operation. The company imports and distributes of Telefunken Semiconductors photovoltaic systems.

The company has a registered capital of 100,000 TRY, distributed in 100 shares of nominal value 1,000 TRY each, Owners of the capital are:

- Volkan Yilmaz. Republic of Turkey, Identity Card No: 11532600932 with 50 shares.
- Hayat Alternatif Yeni Enerji Uretim ve Ticaret, Identity Card No: 11537667208 with 49 shares.
- Timer Werner Tadsemir, Republic of Turkey, Identity Card No: 1137667208 with 1 share.

The company is represented and managed by Volkan Yilmaz. The team consists of highly qualified professionals with extensive experience in various branches of industry, finance, marketing and international relations. In 2013 projects of a total capacity of 1,298kW were initiated and completed. Projects are customized for various corporate and private clients and represent irrigation systems powered by solar energy, solar systems networks located on the ground or on the roof of buildings. For this purpose, the company works with many suppliers and dealers of components such as PV batteries, LED system, as well as subcontractors for the projects. Among the key partners are STAR ELEKTRONIK-ANTALYA, OZSOY ENERJI PETROL-CORUM, ADAN ENERGI – HATAY, SAD PETROL ENERJI-BALIKESIR, PRONEN ENERJI-DENIZLI, ASTAY TEKSTIL-MANAVGAT/ANTALYA, TETRA TELEKOM- MALATYA, TEMIZ ELEKTRIK – MALATYA and others. The Company is developing intensively at rates higher than normal for the industry, driven by an effective management approach and development of projects in areas particularly suitable as climate conditions for their projects and services.

#### 4.6. Board of Directors

##### **KHANDAKAR REZBI      CHAIRMAN**

Mr Rezbi is an established entrepreneur and has enterprising skills both in Management, Sales and Marketing.

After he graduated in Dhaka in 1978, he started his professional career in the same year working for one of the top firms in Bangladesh, Abdul Monem in their Freight Forwarding division. Subsequently he had a very successful 15 years with Coma Creations looking after shipping and freight.

In 1998 he worked for Penguin Marine Services in Sharjah, UAE as their Shipping Manager.

In 2001 he established his own garment factory exporting readymade garments to Europe and USA.

In addition to his garment factory, Mr Rezbi started his Financial Services Company providing

M&A Advise, Lease Finance, Term Finance, Project Finance, Corporate Restructuring, Company Reorganization.

Mr Rezbi has excellent skills in coaching executives in the management of their companies, good accounting practices and financial handling skills.

Mr Rezbi is a director of Anchor Capital Investments Ltd (Anchor) and Emerging Capital Ltd (Emerging) and their respective subsidiaries. As such he has experience with NSX dual listed companies, capital raising and investment companies. Through Anchor and Emerging, the company hopes to be introduced to other renewable energy investments.

#### **MATTHEW GARDINER     MANAGING DIRECTOR**

Matthew J. Gardiner, born on March 17, 1972, was educated at the University of Lincolnshire & Humberside, Hull (GB) in International Management Consulting and finished his studies with an MBA. From 1995 to 1997 Matthew served in Iraq in the Multilingual Army Service of the British Army. From 1998 to 2002 he worked as diplomatic service assistant for the Deutsche Bank AG in Berlin, Germany. Thereafter from 2003 to 2006 as International Business Consultant for Bank Julius Baer & Co. Ltd, Stuttgart, Germany and from 2007 to 2012 as Lead International Holding Communication for FT Energy Management & Cons. in Istanbul, Turkey. Since 2011, Matthew has had management roles in ArToy Ltd specialising as an International Relations Consultant in Istanbul, Turkey and is the Managing Director of Hayat.

### **4.7. Management**

#### **Marco Pissarello Technical Acquisitions Manager**

Marco Pissarello Graduated in 1974 from Liceo Scientifico Cremona Milano, Italy with education in "Maturità' scientifica".

In 1980 Marco got his Degree in Electronic Engineering and Bioengineering with Summa Cum Laude from Politecnico di Milano, Milano, Italy.

Mr Pissarello is CEO Evo Wave Inc.

EvoWave is also a VoIP service provider currently involved in digital voice and data traffic. The EvoWave brand was created for traditional VoIP services and for advanced cloud VoIP services. Its founders have more than 30 years' experience in IT and Telecoms.

He has previously had roles in companies such as Teseo Networks, SplID, AnciTel, Agsm Verona and Real Networks, Milano, Italy.

#### **Zohra N Mogul                     Project Analyst**

Zohra did her BBA in 2004 from Stony Brook University in New York.

Skilled and dedicated Project Controller with more than 10 years of experience financial, planning, and supporting daily operational and administrative functions.

- Demonstrated capacity to provide comprehensive support for Business Director and Division Managers.
- Proven track record of accurately completing research, reporting, and information management within demanding time frames.
- Highly focused and results-oriented in supporting complex, deadline-driven operations; able to identify goals and priorities and resolve issues in initial stages.
- Excellent in Microsoft Office Suite (Word, Outlook, Excel, PowerPoint, Access), Visio, QuickBooks, Deltek CostPoint, Cognos, Lotus Notes, Windows and Mac OS.



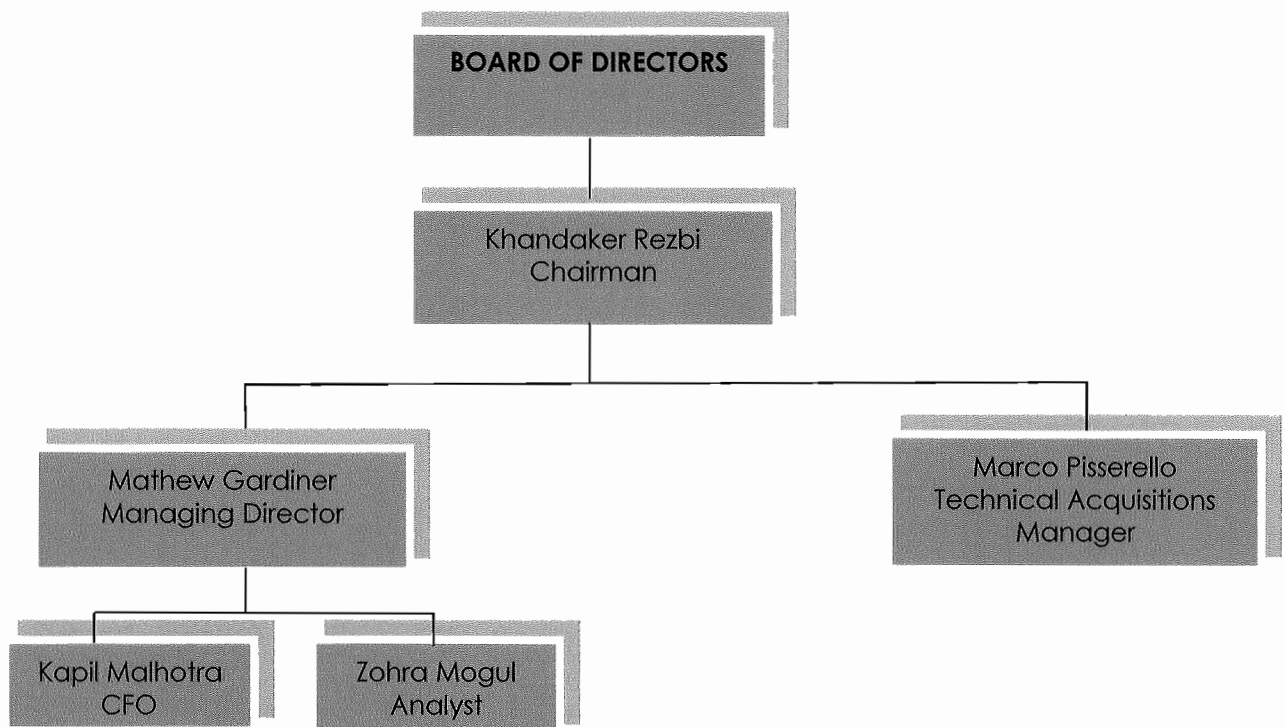
- Speak fluently in Urdu, Bengali, Punjabi, English.
- Excellent writing and oral communication.
- Detail oriented, problem-solver, analytical, organized, and team oriented.

**Mr Kapil Malhotra      CFO**

Mr Kapil Malhotra is a Chartered Accountant.

Mr Malhotra founded Total Solutions Incorporated TSI which now a leading ISO certified strategy consulting organization advising the top corporates like Microsoft, NOKIA, HCL, Cafe Coffee Day, Nirula's, Baskin Robbins, PVR Cinemas amongst many other leading brands.

Total Solutions Group essentially provides Strategy Advise, Market Intelligence Services, Asset Management Systems, Business Re-engineering, Audit Solutions, CRM Solutions amongst other products & services in its portfolio.



## 5. RISK FACTORS

An investment in Energy Solutions International involves a number of risks which are specific to the Company and also of a general nature. This section describes the material risks that may affect the operating and financial performance of the Company and the value of an investment in the Company. It is a summary only and should not be considered exhaustive. Some of these risks can be mitigated through the use of appropriate safeguards and actions, but some are outside the control of the Company and cannot be mitigated. As a consequence, the Company does not make any guarantee that it will achieve its stated objectives and there is no guarantee of a return of capital or of income.

Recipients of this Information Memorandum should carefully consider the following risks, as well as the other information contained in the Information Memorandum before making a decision to apply for CDIs. Before deciding to trade in the CDIs, Shareholders and prospective investors should read the entire Information Memorandum, consider at least the following risk factors in light of their personal circumstances and investment objectives (including financial and taxation issues) and seek professional advice from their accountant, stockbroker, lawyer or other professional adviser.

The operating and financial performance and position of the Company, the value of CDIs and the amount and timing of any dividends that the Company may pay will be influenced by a range of factors. Many of these factors will remain beyond the control of the Company and the Directors. Accordingly, these factors may have a material effect on the Company's performance and profitability which may cause the market price of CDIs to rise or fall over any given period.

Any investment in the Company is regarded as speculative. Neither the Company nor its Directors nor any party associated with the preparation of this Information Memorandum warrants that any specific objective of the Company will be achieved or that any particular targets of the Company will be achieved.

In addition, to the extent that statements in this Information Memorandum constitute forward looking statements, these statements involve known risks, uncertainties and other factors that may cause the Company's investments, actual results, levels of activity, performance or achievements to be materially different from any future results, level of activity, performance, expressed or the forward looking statements. Although the Company believes that the expectations reflected in performance or achievements are achievable, the Company does not assume responsibility for the accuracy and completeness of the statements.

ESI intends to make investments in the renewal energy space in diverse jurisdictions. Its risk profile reflects investment risk generally but is more speculative given the size and nature of the companies and projects invested in and consulted to. Specifically ESI activities are subject to the following risks:

### **Risks of Investing**

Some of the specific risks associated with investments are as follows:

- The success and profitability of the Company's investment activities will depend in part upon the ability to invest in small cap development companies which increase in value over time.

- The market price of the Company's investments can fall as well as rise.
- The Company relies on a number of key personnel to make investment decisions. The loss of any key personnel may have a detrimental effect on the Company.
- The Company may hold minority stakes in companies it takes an investment in and as such will have limited control over those companies.
- The Renewable Energy Sector.

#### **Turkish Renewable Energy Sector:**

The Turkish Renewable Energy market is relatively new and while it currently enjoys Government support, this may change making investment less attractive. Additionally while currently foreign investment is permitted in the sector this also could change or be severely limited.

Turkey neighbours Syria as do the best areas within Turkey for the establishment of Solar Farms. Syria is currently undergoing severe civil and religious unrest. While to date Turkey has been largely unaffected by this it is possible that the unrest could spill into Turkey disrupting the Turkish economy or the solar industry.

#### **Sufficiency of Funding:**

The Company has limited financial resources and may need to raise additional funds to supplement operating capital or in relation to potential future investments as generally discussed herein. Any such fund raising will be subject to factors that may be beyond the control of the Company and its Directors.

#### **Regulatory Risks:**

Operations by the Company or companies invested in may require approvals from regulatory authorities which may not be forthcoming or which may not be able to be obtained on terms acceptable to the Company. While the Company has no reason to believe that all requisite approvals will not be forthcoming Applicants should be aware that the Company cannot guarantee that any requisite approvals will be obtained. A failure to obtain any approvals would mean that the ability of the Company to develop or operate any project may be limited or restricted either in part or absolutely.

#### **Jurisdictional Issues:**

The Company is incorporated as an International Company in Samoa. It is registered as a foreign company in Australia. Its first investment is in a Turkish company and it may hold investments in other jurisdictions. Its CDIs are listed on the NSX in Australia and the Company then intends to be dual listed on the Frankfurt Stock Exchange.

As such the Company and its investments are subject to a myriad of legislation in various jurisdictions, not all of which will be compatible with each other. Additionally Courts in one jurisdiction may not recognize decisions of a court in another jurisdiction or necessarily come to the same result if litigation occurred in respect of the same facts in more than one jurisdiction.

The Company being established in Samoa as an International Company may result in taxation authorities in other jurisdictions seeking to impose tax on income covered in other jurisdictions or may result in the company being unable to open and operate bank accounts in various jurisdictions.

**Foreign Exchange:**

As some of the Company's initial investments as well as potentially future investments, will be in multiple jurisdictions the Company will be exposed to the changing rates of exchange that may affect the rate of return on investment.

**Project Risks:**

Importantly, the Company may not be able to complete any or all of its project undertakings for a variety of reasons, including circumstances that may be outside of the control of the directors and thereby lose its investment project(s).

**Investment Risks Generally:**

Risks of a general nature relating to investment in CDIs and securities generally and especially where the company in which the investment is made has a small market capitalisation.

**Economic Factors:**

The operating and financial performance of ESI is affected by a number of general economic factors which are outside the control of the Company such as inflation, currency fluctuation, interest rates, consumer and business spending and employment rates. Adverse movements in these economic factors may adversely affect the operating and financial performance of the Company.

**Government policy changes:**

Government policies are subject to review and changes from time to time. Such changes are likely to be beyond the control of the Group and may adversely affect its operating and financial performance. At present, the Company is not aware of any reviews or changes that would materially affect its business. However, there is the potential for government reviews and policy changes which may affect the Company's operations.

**Securities investments and Share market conditions:**

There are risks associated with any securities investment. The prices at which the securities trade may fluctuate in response to a number of factors. Furthermore, the stock market may experience extreme price and volume fluctuations that may be unrelated or disproportionate to the operating performance of such companies. These factors may materially adversely affect the market price or value of the securities of the Company regardless of the Company's operational performance. Neither the Company nor the Directors warrant the future performance of the Company, or any return of an investment in the Company.

**Macro-Economic and Political Factors:**

Apart from exchange there are a wide range of macro- economic and political factors beyond the control of the Company which will affect the Company's operations including the consequences of terrorist and other activities which themselves impact adversely on the global economy, demand for and supply of commodities and share market conditions and share prices generally.

**Effect of Economic Cycles:**

Economies move and operate in a cyclical manner which may have positive or adverse effects on markets. Willingness of investors to invest and, consequently, on the capacity of any company to raise capital or thereafter to market any products which it may produce.

## **6. HOW TO INVEST**

### **6.1 How to Invest**

Applications to subscribe for CDIs can only be made by completing and lodging an Application Form attached to this Information Memorandum.

Instructions on how to apply are set out below and in the Application Form attached to this Information Memorandum.

Applications must be for at least 6,667 CDIs (US \$2,000). Applications for more than 6,667 CDIs must be in multiples of 3,334 CDIs (US \$1,000).

All CDIs under the Offer are to be issued at a price of US\$0.30 per CDI payable in full on Application.

No brokerage or stamp duty is payable by Applicants.

Applications for CDIs pursuant to this Information Memorandum must be made using an Application Form attached to this Information Memorandum. Applications should indicate that the Application is for CDIs under the Offer.

Payment for the CDIs must be made in full at the Offer Price of US\$0.30 per CDI.

Completed Application Forms should be sent to Energy Solutions International Ltd at Room 502, 5/F, Prosperous Building, 48-52 Des Voeux Road Central, Hong Kong by 5pm (Hong Kong time) on the Closing Date together with cheques for the Application moneys. Cheques should be made out to Energy Solutions International Ltd.

### **6.2 Allotment and Issue**

Allotment and issue of the CDIs offered by this Information Memorandum will take place as soon as practicable after the Closing Date and in compliance with ICA and the Listing Rules. Prior to the allotment of CDIs pursuant to this Information Memorandum, all application monies shall be held by the Company on trust.

The Directors reserve the right to allot CDIs in full for any Application or allot any lesser number or to decline any Application. Where the number of CDIs allotted is less than the number applied for, or where no allotment is made, the surplus Application monies (excluding interest) will be returned by cheque to the Applicant within seven (7) days of the allotment date.

Applicants must not assume that CDIs, or any number of CDIs, will be issued to them in response to their Application or in relation to the Offer size. The Company reserves the right to reject Applications or to scale back the number of CDIs offered in respect of an Application. The Company will reject any Application where the Applicant has an address in Australia, the United States or Samoa. Before purporting to deal with any CDIs in anticipation of issue to the Applicant, each Applicant must satisfy themselves as to the number of CDIs to which they have become entitled.

### **6.3 Subscription**

The total amount to be raised under this Information Memorandum is US\$150,000.

If US\$150,000 has not been raised within 4 months after the date of issue of this Information Memorandum, the Company shall repay (without interest) as soon as practicable all money received from Applicants for the CDIs.

#### **6.4 Opening and Closing Dates**

Submission of Applications may be made on or after the Opening Date. Application Forms duly completed with full payment of Application monies must be received by 5.00 p.m. Hong Kong time on the Closing Date. The Company reserves the right to close the Offer early or extend the Closing Date at its discretion without notice.

#### **6.5 NSX Listing**

Application will be made to the NSX, for official quotation of the Company's CDIs to be issued under this Information Memorandum on the Official List of the NSX. No CDIs will be issued pursuant to this Information Memorandum unless such permission is obtained from the NSX.

If application to list on the NSX is not made, or if the CDIs issued pursuant to this Information Memorandum, are not listed for quotation within six months after the date of this Information Memorandum, all application monies will be refunded (without interest) as soon as practicable.

If the NSX admits the Company to the Official List, that fact is not to be taken in any way as an indication of the merits of ESI or of the CDIs now offered for subscription. The NSX, its officers and employees, take no responsibility for the contents of this Information Memorandum.

#### **6.6 CHESS – Clearing House Electronic Sub-Register System**

The Company will apply for admission to participate in the Clearing House Electronic Sub-Register System (CHESS) in accordance with the Listing Rules and ASX Settlement Operating Rules (Settlement Rules). CHESS is operated by the ASX Settlement Pty Ltd (ASXS), a wholly owned subsidiary of Australian Securities Exchange Ltd, in accordance with the Listing Rules and the Settlement Rules. On admission to CHESS, the Company will operate an electronic issuer sponsored sub-register and electronic CHESS sub-register. The two sub-registers together will make up the Company's principal register of securities.

Under CHESS, the Company will not issue Share certificates to successful Applicants. Instead, successful Applicants will receive a holding statement, which sets out the number of CDIs that have been allocated to them pursuant to this Information Memorandum. If the Shareholder is broker sponsored, ASXS will send a CHESS statement.

A holding statement (whether issued by the Company or CHESS) will also provide details of a Shareholders Holder Identification Number (HIN) (in the case of a holding on the CHESS sub-register) or Securityholder Reference Number (in the case of a holding on the issuer-sponsored sub-register).

Following distribution of these initial holding statements to all Shareholders, a holding statement will only routinely be provided to a Shareholder at the end of any subsequent month during which the balance of the Shareholder's holding of CDIs changes.

## **6.7 Privacy**

If you complete an Application Form, please note you are providing personal information to the Company, either directly or via the Share registry. The Company collects, holds and will use that information to assess your Application, service your needs as a Shareholder, facilitate distribution of payments and corporate communications to you as a Shareholder and carry out administration.

The information may also be used from time to time and disclosed to persons inspecting the Share register, bidders for your CDIs in the context of takeovers, regulatory bodies, authorised securities brokers, print service providers, mail houses and the Company Share registry.

Please note you can access, correct and update the personal information that we hold about you or an associated entity. Please contact the Company or its registry if you wish to do so at the relevant contact numbers set out in this Information Memorandum.

Collection, maintenance and disclosure of certain personal information is governed by legislation and certain rules such as the Settlement Rules. Please note also that if you do not provide the information required on the Application form, the Company may not be able to accept or process your Application.

## **7. ADDITIONAL INFORMATION**

### **7.1. Material Contracts**

The descriptions of the Material Contracts in this sub-section do not purport to be complete and are qualified in their entirety by reference to the full terms of the Material Contracts. Apart from the matters mentioned below there are no contractual arrangements considered to be material for the purposes of this Information Memorandum and the Offer.

A summary of the material terms of each of the above contracts is set out hereunder:

#### **(a) Hayat Acquisition Contract**

On 16 March 2015, Artoy agreed to transfer shares equal to 66% of Hayat in exchange for 1,350,000 fully paid ordinary Shares and 720,00 fully paid "A" Class Converting Shares in the capital of the Company.

#### **(b) Hayat Option Agreement**

On 23 April 2015, Hayat and its shareholders other than the Company, granted the Company the option to acquire a 100% interest in any or all of the six Solar Energy Farms in which Hayat has the right to invest.

Under this agreement, when Hayat decides to commence construction of one of the projects it shall request additional funding from its shareholders for the project. At that time the Company can elect to fund 100% of the project. The project will then be transferred to the Company but construction and operation will be undertaken by Hayat for the Company. Net of Hayat management costs all profits from the project will be for the benefit of the Company.

### **7.2. Restriction Agreements**

ESI expects it will enter into a restriction agreements in the form set out in the NSX Listing Rules as per the requirements of the NSX with each of Khandakar Rezbi and Artoy in respect of between 750,000 and 1,500,000 CDIs for up to 2 years. ESI also expects the holdings of "A" Class Converting Shares to also be escrowed for two years.

The restriction agreements provide that the Shareholder will not apply for the CDIs held by him to be traded on the NSX for a period after the date of listing as determined by NSX.

### **7.3. Rights and Obligations Attaching to Shares**

The ordinary Shares which are represented by the CDIs to be issued pursuant to this Information Memorandum will rank equally in all respects with the Company's existing ordinary Shares.

The rights, privileges, liabilities and restrictions attaching to Shares are set out in the Constitution of the Company.



**Buy Back**

The Company may buy Shares in itself in accordance with the International Companies Act 1987 (Samoa) on the terms and at the times determined by the Board.

**Calls on Shares**

Where Shares are issued as partly paid (at present there are none) the Directors may make calls upon the holders of those Shares to pay the whole of or a portion of the balance of the issue price. If a Shareholder fails to pay a call or instalment of a call, then subject to the International Companies Act 1987 (Samoa) and the Listing Rules the Shares in respect of the call may be forfeited in accordance with the Company's Constitution.

**Unmarketable parcels**

Subject to certain conditions the company may sell unmarketable parcels on issue as agent for the holders of those parcels. Shareholders will be provided with 6 weeks' notice enabling them to elect to retain their Shares, the Shares may be sold and the proceeds held in trust on behalf of the Shareholder.

**7.4. Rights of CDI Holders**

With the exception of voting rights CDI holders have the equivalent rights as holders of ordinary Shares whereby the security is registered in their own name. This means that all economic benefits such as dividends, bonus issues, rights issues or similar corporate actions flow through to the CDI holder as if the CDI holder were the legal owner.

The ASX Settlement Operating Rules require the Company to give notices to CDI holders of general meetings of Shareholders. The notice of meeting must include a form permitting the CDI holder to direct CDN to cast proxy votes in accordance with the CDI holder's written directions. CDI holders cannot vote directly at Shareholder meetings. The CDI holder must convert their CDIs into certificated Shares prior to the relevant meeting in order to vote at the meeting in person.

**7.5. Converting from a CDI to a Share**

CDI holders may at any time convert their holding of CDIs (tradeable on NSX) to certificated Shares by:

1. for CDIs held through the issuer sponsored sub-register, contacting BoardRoom in Australia directly to obtain the applicable request form. The removed holding would then be registered into the same address that appeared on the Australian Share register; or
2. for CDIs held on the CHESS sub-register, contacting their controlling participant (generally a stockbroker), who will liaise with BoardRoom in Australia to obtain and complete the request form.

Upon receipt of a request form, the relevant number of CDIs will be cancelled and Shares will be transferred from CDN into the name of the CDI holder and a registered share certificate be issued. This will cause your CDIs to be registered on the certificated Samoan Register of Members and trading will no longer be possible on NSX.

A holder of Shares may also convert their Shares to CDIs, subject to any escrow arrangements, by contacting BoardRoom or their stockbroker (or applicable controlling participant). In this case, the

Shares registered in the Shareholder's name will be transferred to CDN and a holding statement in respect of the CDIs will be issued to the Shareholder. The CDIs will be tradeable on NSX.

## **7.6. Rights attaching to 'A' Class Convertible Shares**

Each Convertible Share has no rights to dividends but rank equally in all other respects with Ordinary Shares. The 'A' Class Convertible Shares will automatically convert into Ordinary Shares following the raising of a minimum of US\$30,000,000 in additional share capital unless the holders of the 'A' Class Shares would hold greater than 75% of the Ordinary Shares or CDIs on issue in which case only such numbers as would mean the holders would hold no more than 75% of the Ordinary Shares or CDIs on issue would convert with the remainder converting only when the 75% threshold is no longer met. The 'A' Class Convertible Shares will not be listed on any stock exchange. No additional 'A' Class Convertible Shares other than those on issue at the date of this Information Memorandum can be issued.

## **7.7. Samoan Corporate Law**

Energy Solutions is incorporated in Samoa as an International Company under the *International Companies Act 1987* (Samoa) (the "ICA") and is subject to the laws of Samoa. The following section set outs some of the laws and regulations concerning Shares in a company incorporated in Samoa.

This summary is provided as a guide only. You should seek your own professional advice in relation to the corporate law provisions in Samoa.

### **1. Restrictions on Membership**

Under the ICA no natural person who is a citizen or resident of or domiciled in Samoa and no company incorporated or registered under the *Companies Act 1955* (Samoa) except a trustee company may be a Shareholder of an International Company such as Energy Solutions.

### **2. Powers of Company**

An International Company such as ESI has all the powers of a natural person unless specifically excluded by the company's Memorandum and Articles of Association.

### **3. Authorised Shares and Issue of Shares**

Subject to the ICA and to the Company's Memorandum or Articles of Association, an International Company shall have the power to issue Shares having par value or no par value or a combination of both. The Shares may be divided into one or more classes, with such rights and preferences as are provided for in the articles. The minimum issued capital is one Share of no par value or one Share of par value. Shares may be expressed in any currency.

### **4. Alterations of Share capital**

The ICA provides that an International Company may, by special resolution, alter its memorandum and articles of association to:

- increase its share capital by the creation of new shares of par value or shares having no par value;
- consolidating or dividing its share capital or consolidating and reducing its share capital;
- converting ordinary or preference shares with par value into shares with no par value and vice a versa;
- cancelling shares that have not been taken or agreed to be taken or which have been

**Share Capital**

The share capital in the Company consists of ordinary Shares and A converting shares. All existing issued ordinary Shares and Shares underlying the CDIs to be issued pursuant to this Information Memorandum are of the same class and rank equally in all respects.

**Voting Rights**

Subject to any rights for the time being attached to any class or classes of shares and provided no amount due and payable in respect of a call is unpaid, (at present there are no partly paid shares or unpaid calls) at a general meeting of the Company every holder of Shares present in person or by proxy, attorney or representative has one vote on a show of hands, and on a poll, one vote per Share.

**Dividend Rights**

Subject to the rights of holders of Shares issued with any special preferential or qualified rights, the profits of the Company which the Directors of the Company may from time to time determine to distribute by way of dividend will be declared and paid according to the proportion which the amount paid (not credited) is of the total amounts paid and payable (excluding amounts credited), on the Shares in respect of which the dividend is paid. Any amount paid up on a Share during the period in respect of which a dividend is declared only entitles the holder of that Share to an apportioned amount of that dividend as from the date of payment.

**Rights on Winding-up**

Subject to the Company's Constitution and any special rights attaching to any class of Shares, Shareholders will be entitled in a winding up to share in any surplus assets of the Company in proportion to the Shares held by them.

**Transfer of Shares**

Subject to the Company's Constitution and the International Companies Act 1987 (Samoa), the Company's Shares are freely transferable.

**Creation and Issue of Further Shares**

The allotment and issue of any new shares is at the discretion of the Board. Subject to any restrictions on the allotment of shares imposed by the Company's Constitution, or the International Companies Act 1987 (Samoa), the Board may issue those new shares on such terms and conditions, and with rights and privileges, as the Board from time to time may determine.

**Variation of Rights**

At present the Company has only ordinary Shares and A Converting shares on issue. If shares of another class are issued, the rights, privileges and restrictions attaching to the Shares may be altered with the sanction of a special resolution passed at a separate general meeting of the holders of the Shares, or with the written consent of at least three quarters of the holders of the Shares.

**General Meetings**

Each holder of Shares is entitled to receive notice of, and to attend and vote at, general meetings of the Company and to receive all notices, accounts and other documents required to be furnished to Shareholders under the Company's Constitution, the International Companies Act 1987 (Samoa) and the Listing Rules.

forfeited;

- changing the denomination of the currency of the shares.

**5. Reduction of Share**

Subject to its Memorandum and Articles of Association, an International Company may reduce its share capital by passing a special resolution of Shareholders.

**6. The Directors**

The minimum number of directors for an International Company such as ESI is one. The directors may be natural persons or subject to the Company's Memorandum and Articles of Association, bodies corporate. The directors need not be residents of Samoa nor, subject to the Memorandum and Articles of Association, is there any share qualification.

**8. Company Secretary**

An International Company must appoint a company secretary who must be a resident of Samoa. The company secretary can be a natural person or a body corporate.

**9. Annual General Meetings**

An International Company must hold its first annual general meeting within 18 months of the date of its incorporation and thereafter within six months of the end of its financial year.

**10. Extraordinary General Meetings**

Notwithstanding anything in the Memorandum and Articles of Association, the directors of an International Company must convene a meeting of Shareholders upon receiving a requisition of not less than 10% of the paid up capital to be held as soon as practicable but not later than 2 months after receipt of the requisition.

**11. Financial Statements**

There is no requirement under an ICA to lodge accounts, however, an International Company must keep such record as the directors consider necessary to reflect the financial position of the company.

**12. Taxation**

Companies incorporated under the ICA are not liable to pay income or corporate tax in Samoa.

**7.8. Litigation**

The Company is not currently involved in any litigation or arbitration and is not aware of any threatened litigation or pending arbitration by or against it that is material.

**7.9. Communication and Continuous Disclosure**

*Communication to Shareholders*

The Board aims to ensure that Shareholders are informed of all major developments affecting the Company's state of affairs. Information will be communicated to Shareholders through NSX announcements, the Company's annual report, annual general meeting, half and full year results announcements and the Group's website.

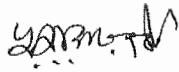
#### **7.10 Statement of directors**

The Directors report that after due enquiries by them, in their opinion, there have not been any circumstances that have arisen or that have materially affected or will materially affect the assets and liabilities, financial position, profits or losses or prospects of the Company, other than as disclosed in this Information Memorandum.

#### **7.11 Authorization**

This Information Memorandum is authorized by a resolution of the directors of the Company who consent to its lodgment with the NSX and its issue.

Signed by a director of the Company.



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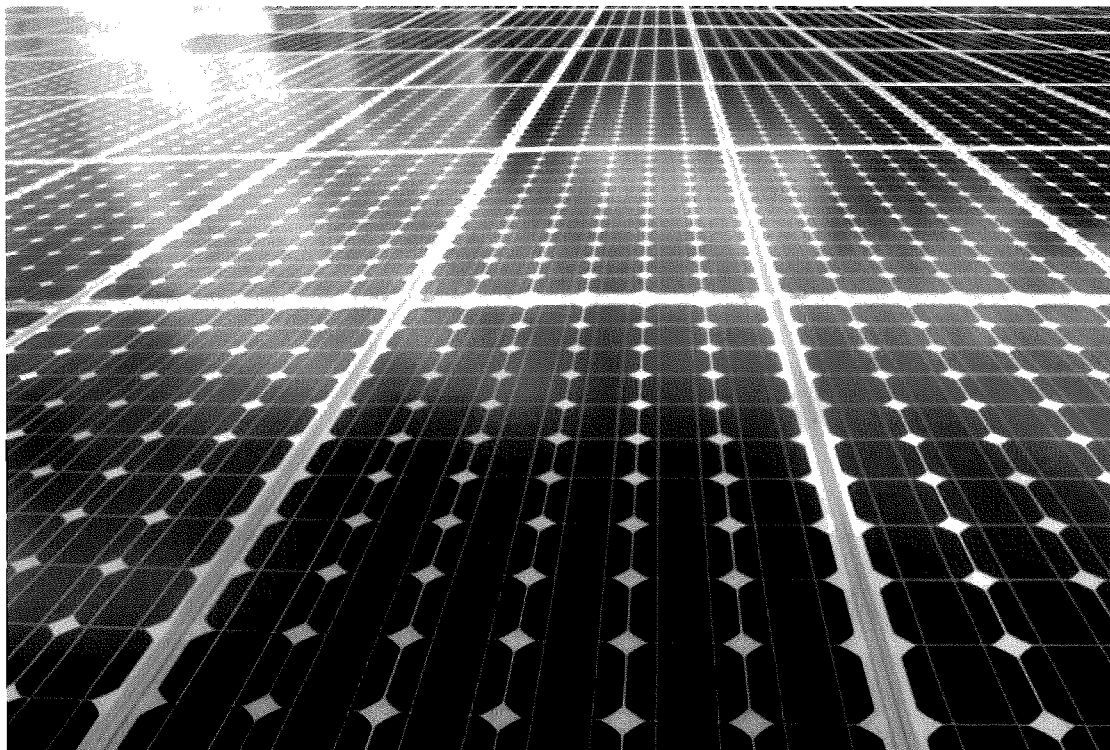
KHANDAKER ABUL KASHAM REZBI

Dated: 5 June 2015

**"A"**

**CW Energy Valuation**

# COMPANY VALUATION



**FOR DETERMINATION OF THE FAIR MARKET  
VALUE OF THE EQUITY OF CW ENERJI TICARET  
VE SANAYI LTD.**

**FINAL REPORT**



**RENEWABLE ENERGY ADVISORS**

**Bulgaria • Austria • Germany • France • UK • Italy • Dubai**

**15<sup>th</sup> August 2014  
Varna, Bulgaria**

This final company valuation report has been elaborated according to contract signed on 15<sup>th</sup> May 2014 between the Assignor (CW ENERJİ TİC VE SAN LTD ŞTİ.) of the company valuation and a chosen by him Assignee (Inea Consulting Ltd.)

During the process of elaboration of this final company valuation report we passed out through the following stages:

Valuation report status	Date	Version	Approved (Yes/No)
Draft	16.05.2014	1.0	Yes
Draft	21.05.2014	2.0	Yes
Draft	27.05.2014	3.0	Yes
Draft	30.05.2014	4.0	Yes
Draft	05.06.2014	5.0	Yes
Draft	12.06.2014	6.0	Yes
Draft	24.06.2014	7.0	Yes
Draft	12.08.2014	8.0	Yes
Final	15.08.2014	9.0	Yes

Inea Consulting Ltd. guarantees herewith accuracy, honesty, objectivity and independence applied in this company valuation and declares that Inea Consulting Ltd. doesn't have any commercial interest from this company valuation and doesn't have any commercial relations with owners of CW Enerji Ltd.

In this company valuation we have used our professional knowledge and experience, and we did not intentionally concealed substantial facts and/or circumstances.

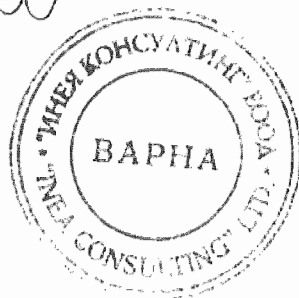
Signature:

Ilko Iliev

CEO

Inea Consulting Ltd.

15<sup>th</sup> August 2014



Signature:

Ivailo Milchev

Senior Financial Analyst

Inea Consulting Ltd.





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## **1 SCOPE AND BASIS OF VALUATION. LIMITATIONS.**

### **1.1 SCOPE AND BASIS OF VALUATION**

#### **Purpose of the valuation**

The objective of this valuation report is to present hypothetical value calculation of the fair market value (FMV) of 100% interest in the equity of CW ENERJİ TİCARET VE SANAYİ LTD.ŞTİ. (further short named also as CW Enerji Ltd.), as of 15<sup>th</sup> August 2014, (hereinafter referred also as the “Valuation”) in the context of a strategic investment purposes and decision by the Company’s management and shareholders.

#### **Valuation date and validity**

This final company valuation report is executed on 15<sup>th</sup> August 2014. The valuation date (hereinafter referred also as “the Valuation Date”) is 31.12.2013. Therefore all source data is provided up to 31.12.2013 and all calculations based on data up to 31.12.2013 and to the legal status of CW Enerji Ltd. to this date. This final valuation report is valid at the date of its creation. Further use of this valuation report may require update. It is recommended market adequacy of this final company valuation report to be considered up to 31.12.2014, and after this date established values shall be updated or re-confirmed.

#### **Standard of Value**

For purposes of this valuation, fair market value (FMV) is defined as the price at which the company CW Enerji Ltd. would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of relevant facts.

The conclusion of a fair market value reached is a reasonable estimate of the price at which CW Enerji Ltd. may change hands between two willing parties. It should be understood that the actual price paid in a transaction involving this company may differ from the appraised fair market value due to factors such as the motivation of the parties, the negotiating skills of the parties, the structure of the transaction (e.g. financing structure, or other factors unique to the transaction).

### **Going concern premise**

We value the Company under the premise of a going-concern business enterprise. This premise of value considers that management of the Company will implement only those prospective financial and operational strategies that will maximize the value of the business entities. Additionally it assumes that there is no uncertainty about future events, such as recurring operating losses or financial difficulties that would call into question the fundamental assumption that the Company can continue to operate as a going-concern.

### **Controlling interest**

Since the equity interest valued represents 100% of the shares of the Company, we value the Company on a controlling interest basis. The term “controlling interest” is defined as interest in a business enterprise where the necessary elements of control are present. These elements of control include: choosing management and management compensation; acquiring or liquidating assets; setting dividend policies and controlling future company direction. It is clear that someone possessing a controlling position has some very valuable rights that a minority shareholder or group does not possess. Accordingly, a minority interest in a company in most cases will be less than its pro rata share of the controlling interest value.

### **Hypothetical conditions**

The Valuation was prepared under the assumption that the Company will complete to follow strictly its sales plan for the period 2014 - 2018, finalize the required investments and develop in accordance to the current management’s business plan. Further the management’s business plan assume a fast growing business model for the Company, along with all necessary related commercial activities that are already and currently performed by the Company. Any deviation from the above conditions, changes in the business plan, sales plan and investment program, forecast future performance and/or assumed business model will have material effects on the estimates derived in this value calculation assignment.

### **Non-disclosure**

This Final Valuation Report is prepared specifically for the confidential use of CW Enerji Tic. San. ve Ltd. Şti. and Energy Solutions Ltd.

may only be utilized for the purpose set forth in this report. The Final Report should not be quoted or referred to or used for any other purpose prior signing of the hold harmless letter by the party receiving the information. In the event such written consent is provided together with the signed hold harmless letter, then the Report or other written material produced by Inea Consulting Ltd. will be reproduced in their entirety including any disclaimers of liability.

This final report must not be made available or copied in whole or in part to any person other than the Shareholders and the Board of Directors of the Assignor and related companies, experts, advisors and employees appointed by the Assignor or in business relations with the Assignor without the prior signing of the hold harmless letter by the receiving party. The Assignor accept the full responsibility to obtain a signed copy of the hold harmless letter from the third party to which the valuation results or Reports will be disclosed prior to releasing the confidential information or document. The Assignor further agrees to indemnify Inea Consulting Ltd. against third parties in case that hold harmless letter was not obtained from the receiving third party. Inea Consulting Ltd. accepts no responsibility for any reliance that may be placed on the Report should they be used by any party or for any purpose that has not been expressly agreed by Inea Consulting Ltd.

### **Copyright**

This final company valuation represents intellectual property rights according to the International Copyright Law and its related laws, and is ownership of the Assignor (CW ENERJİ TİC. SAN. LTD. ŞTİ) and the Assignee (Inea Consulting Ltd.)

## **1.2 LIMITATIONS**

### **1.2.1 Limitations of services**

The Valuation was prepared by placing full reliance on the data, assumptions and information supplied by the management of the Company. Whereas we have not assessed the correctness of the information provided to us by the management, but we have tested it by comparing the projections and financial figures of the past provided to us with comparable projects accompanied by us in the past and have thus come to the conclusion that – provided the information presented to us is correct – the financial projections can be considered to not be unreasonable.

We assume no responsibility for the legal description or matters including legal or title considerations. Titles to the subject assets, properties, or business interests are assumed to be good and marketable unless otherwise stated. We also consider that there is responsible ownership and competent management with respect to the subject assets, properties or business interests. The subject assets, properties, or business interests are appraised free and clear of any or all liens or encumbrances unless otherwise stated. We assume that there is full compliance with all applicable regulations and laws unless non-compliance is stated, defined, and considered in the valuation report.

We assume that all required licenses, certificates of occupancy, consents, or legislative or administrative authority from any local, state, or national government, private entity or organization have been or can be obtained or renewed for any use on which the value calculation contained in this report is based.

Our conclusions do not serve as a substitute for the due diligence process, and a lending institution or any other third party should perform their own due diligence in order to structure any possible transaction. Accordingly, our Report is not intended for the benefit of a financial institution or any other third party and should not be taken to supplant other inquiries and procedures that a financial institution, or any other third party, should undertake for the purpose of considering a transaction with the Company.

We have not sought or received confirmation, information or clarifications from the counterparties to the agreements, arrangements or documents provided to us, nor from any other third party, as to the status of such agreement, arrangement or document, the relationship between the parties thereto or otherwise.

#### **1.2.2 Limitations of photovoltaic market overview**

Market overview in Chapters 4, 5 and 6 does not contain descriptions of each reviewed documents. We have only identified and discussed those documents and issues, which we regard as being material in the context of the photovoltaic energy industry in Turkey. The accuracy of this market overview is dependent on the Reviewed Documents being true, complete, accurate and not misleading. This overview is a key issues market outlook and does not purport to provide a very detailed description of all the facts that we have established in the course of Turkish photovoltaic industry development.

It is important to mention that we consider in our market overview and analysis only solar photovoltaic segment. Concentrated solar power and solar thermal sectors are not subjects to our overview.

Our conclusions are based on information and data gathered through extensive industry research including:

- Industry reports from reputable institutions;
- Interviews with industry stakeholders including executives and managers of companies operating in the sector, owners of photovoltaic energy projects, journalists and government officials;
- Detailed review of articles published in the last 3 years by reputable local and international media.



## 2 EXECUTIVE SUMMARY

This final valuation report gives estimation of the fair market value of the company, assuming and based on the data received from company's management, business development plan and sales forecast. Final valuation report reveals as well current state and future trends about photovoltaic energy sector in Turkey as a potential area for investment and solid ground for further growth of the company.

### 2.1 FAIR MARKET VALUE (FMV) OF CW ENERJİ LTD.

The ASSET approach and INCOME Approach were used for calculating the value of the CW ENERJİ TİCARET VE SANAYİ LTD.ŞTİ. (CW Enerji Ltd.) The value conclusion is based on the results of the Income Approach under Discounted Cash Flow (DCF) method as it presents a more realistic picture of the fair market value (FMV) of a fast growing and profit gaining company in fast growing photovoltaic market in the long run.

Asset approach is used only to benchmark the value estimates and is used with zero weight rate for final value conclusion due to the rapidly growing market of services related to the production of renewable energy and photovoltaic energy particularly, and maximizing the potential of the company based on the experience of the management of CW ENERJİ in this respect.

On the basis of the performed sensitivity analysis, calculations and assumptions we determine the fair market value (FMV) of the 100 % of the equity of CW Enerji Ltd. as follows:

➤ Equity:	307,856,000 TRY
➤ 1 company share:	3,078,560 TRY

Respective fair market value (FMV) represented in EUR is as follows:

➤ Equity:	106,888,000 EUR
➤ 1 company share:	1,066,980 EUR

**Note:** Used currency exchange rate for this calculation is EUR/TRY - 0.34659

## 2.2 BRIEF PROFILE OF TURKISH PHOTOVOLTAIC MARKET

**Market Characteristics:** Turkey is very promising emerging market for photovoltaic energy investments amongst SEE countries. With the introduction of support mechanisms in the law in 2005 and the subsequent amendments in 2007, 2010, 2012 and 2013, Turkish photovoltaic energy market is supposed to start growing in next years. The country had cumulative installed capacity photovoltaic of approximately **89 MW** at the end of 2013, and with an expected capacity to reach 204 MW by the end of 2014. After five years is expected cumulative installed photovoltaic capacity in Turkey to reach **2,927 MW** by the end of 2018 according to our best case scenario forecast. At the end of 2013 the cumulative value of the market was **€ 142.4 million**, expecting to reach about **€ 4.36 billion** by the end of 2018.

Furthermore Turkey was ranked as the world's third most attractive emerging photovoltaic (PV) market, followed by Romania according world consulting firm IHS emerging PV markets attractiveness survey released at the end of Q4 2013. Rising energy prices have pushed photovoltaics to reach grid parity more quickly than previously expected.

**Feed-In-Tariff Regulation:** The Turkish feed-in tariff for solar PV now stands at 13.3 USD cents per kWh. Preferential rates are guaranteed for 10 years. The government offers additional incentives for local procurement if there is a domestic component in the manufacture of the photovoltaic turbine. Local involvement can increase the tariff to 20 USD cents per kWh. Local procurement incentives apply for the first five (5) years of operation of the photovoltaic power plants. Solar developers can sell into a national power pool or they can contract privately with customers where prices are generally higher than the guaranteed price. Turkey's national transmission company TEIAS is required to provide grid connections to all renewable power projects.

### 3 COMPANY PROFILE. LEGAL STATUS AND PRINCIPAL ACTIVITY

CW ENERJİ TICARET VE SANAYİ LTD (CW Enerji Ltd.) is a limited liability company, registered in the Trade Register in Antalya, with a management address Mahallesi, Kuskavagi Caddesi, No 42/A Konyaalti/Antalya.

The company had the following object of activity: construction of solar power plans and on-grid and off-grid hybrid renewable installations, in terms of performance of assigned projects including a turnkey servicing in the field of design, engineering, procurement, assembly and completion of PV systems, installation and putting into operation. The company is a member of Telefunken Semiconductors group doing business in the field of photovoltaic systems in Europe and the Far East.

The company has a registered capital of 100,000 TRY, distributed in 100 shares of nominal value 1,000 TRY each. Owners of the capital are:

- Volkan Yilmaz, Republic of Turkey, Identity Card No: 21632600932 with 50 shares
- Hayat Alternatif Yeni Enerji Uretim ve Ticaret A.S. with 49 shares.
- Timur Werner Tasdemir, Republic of Turkey, Identity Card No: 11537667208 with 1 share.

The company is represented and managed by Volkan Yilmaz. The team consists of highly qualified professionals with extensive experience in various branches of industry, finance, marketing and international relations. In 2013 were initiated and as at the time of the assessment are completed projects of a total capacity of 1,298 kW. Projects are customized for various corporate and private clients and represent irrigation systems powered by solar energy, solar systems networks located on the ground or on the roof of buildings. For this purpose, the company works with many suppliers and dealers of components such as PV modules, grid inverters, solar sensors, cables and connectors, power panels, relays, solar batteries, LED systems, as well as subcontractors for the projects. Among the key partners are STAR ELEKTRONİK - ANTALYA, OZSOY ENERJİ PETROL - CORUM, ADAN ENERJİ - HATAY, SAD PETROL ENERJİ - BALIKESİR, PRONEN ENERJİ - DENİZLİ, PAM SOLAR - DENİZLİ, ASTAY TEKSTİL - MANAVGAT/ANTALYA, TETRA TELEKOM - MALATYA, TEMİZ ELEKTRİK - MALATYA and others. The Company is developing intensively at rates higher than normal for the industry, driven by an effective management approach and development of projects in areas particularly suitable as climate conditions for their products and services.

## **4 COUNTRY PROFILE OF TURKEY**

### **4.1 BASIC COUNTRY FACTS**

Being located at the crossroads of Asia, Europe and Africa, makes Turkey one of the most geopolitically strategic countries of the world. Because of having the shortest intercontinental routes, it is where the Eastern and Western civilizations meet. The center of major trade and migration routes, Turkey has Georgia, Armenia, Nakhchivan and Iran to the east, Turkey and Greece to the west and Iraq and Syria to the south. Turkey is surrounded by the Black Sea, the Aegean and the Mediterranean. The Marmara Sea, the Bosphorus, and the Dardanelles are distinctive features of the Turkish geography.

Located between 36 and 42 degrees north latitude and 26 and 45 degrees east longitude, with an area of 783,602 square kilometers, Turkey has a land surface area larger than all its neighbors except for Iran, and larger than all European countries except for the Russian Federation<sup>1</sup>. 3% of the landmass is located in Europe and is called Thrace, the 97% in Asia is called Anatolia.

Turkish total road network is over 64,865 km, of which more than 31,395 km are state roads, 31,390 km are provincial roads and 2080 km are motorways. Turkey has 2.627 kilometers of territorial borders. The transportation-communication sector in Turkey ranks first in terms of public investments with a share of 26% in the 2007-2013 period as of 2006 prices and it is the major sector in the public fixed assets investments.<sup>2</sup> Turkey lies between Asia and Europe serving as a bridge geographically, culturally and economically. Its location on two continents plays a central part in Turkish history and gives the country's transportation and logistics sector a major advantage in serving the markets of Europe, the Middle East and North Africa.

As an administration the territory of the Republic of Turkey is divided into 81 provinces. A province is administered by an appointed governor, and was formerly termed a "governorate". The provinces are divided into a number of different districts. Each province has a government area in the central district, and may include other districts. In all but three cases, the government area bears the same name as the province. The exceptions are Antakya (in Hatay), Izmit (in Kocaeli) and Adapazari (in Sakarya).

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<sup>1</sup> <http://www.byegm.gov.tr/docs/Turkiye2011/english/014-15.htm>

<sup>2</sup> <http://www.byegm.gov.tr/docs/Turkiye2011/english/300-301.htm>

Some major facts about Turkey are summarized below:

- **Area:** 783,562.38 sq.km. / 302 535.13 square miles
- **Population:** (2013) 76.6 million
- **Median age:** (2013) 30.1 years
- **Real GDP growth rate:** + 4% (2013)
- **Literacy rate:** 87.4 % of population
- **Native language:** Turkish (official), Kurdish, other minority languages
- **Foreign languages:** English, German, French, Russian
- **Religion:** Muslim 99.8% (mostly Sunni), other 0.2% (mostly Christians and Jews)
- **Government:** Parliamentary democracy
- **Currency:** Turkish lira (TRY)
- **Affiliations:** NATO, WTO, OECD, OIC

#### 4.2 POLITICAL CLIMATE AND RULING PARTY

The function of head of state is performed by the president (*Cumhurbaşkanı*). A president is elected every five years on the principle of universal suffrage according to the current constitution. The president does not have to be a member of parliament, but he/she must be over 40 years old and hold a bachelor's degree. The current president Abdullah Gül was elected by Parliament on August 28 2007.

Executive power rests with the president, the prime minister (*Başbakan*) and the Council of Ministers (*Bakanlar Kurulu*) (Cabinet Erdoğan III). The ministers don't have to be members of Parliament (a recent example is Kemal Derviş). The prime minister is appointed by the President and approved through a vote of confidence (*güvenoyu*) in the Parliament. The prime minister is Recep Tayyip Erdoğan, whose conservative Justice and Development Party won a majority of parliamentary seats in the 2011 general elections. Legislative power is invested in the 550-seat Grand National Assembly of Turkey (*Türkiye Büyük Millet Meclisi*), representing 81 provinces. The members are elected for a four-year term by mitigated proportional representation with an election threshold of 10%. To be represented in Parliament, a party must win at least 10% of the national vote in a national parliamentary election. Independent candidates may run, and to be elected, they must only win 10% of the vote in the province from which they are running.

Local elections were held spring 2014 with serious win of Prime Minister Erdoğan, presidential elections for summer 2014, and parliamentary elections for 2015, with a possible constitutional referendum in between. The Justice and Development Party of Prime Minister Erdoğan has been in power since 2002.

#### **4.3 GDP AND ECONOMIC GROWTH**

Turkey's largely free-market economy is increasingly driven by its industry and service sectors, although its traditional agriculture sector still accounts for about 25 percent of employment. Turkey for 2013 was the 16<sup>th</sup> largest economy in the world and the 6<sup>th</sup> largest in Europe with a GDP of approx. USD 820 billion in 2013. With an economic boom of 9 percent and 8.3 percent in 2010 and 2011 a slow down to 2.2 percent in 2012, Turkish GDP grown by 4 percent in 2013 and is expected to grow to 4.2 percent in 2014, 4.7 percent in 2015, 5.1 percent in 2016 and 5.2 percent in 2017. Foreign direct investments (FDI) are up 50 percent y-o-y to USD 4.2 bln in Q1 2014.

Significant improvements in such a short period of time have registered Turkey on the world economic scale as an exceptional emerging economy, the 16<sup>th</sup> largest economy in the world and the 6<sup>th</sup> largest economy when compared with the EU countries, according to GDP figures (at PPP) in 2013.

Together with stable economic growth, Turkey has also reined in its public finances; the EU-defined general government nominal debt stock fell to 36.3 percent from 67.7 percent between 2003 and 2013. Hence, Turkey has been meeting the “60 percent EU Maastricht criteria” for public debt stock since 2004. Similarly, during 2003-2013, the budget deficit decreased from more than 10 percent to less than 3 percent, which is one of the EU Maastricht criteria for the budget balance.

Turkey's GDP expanded by 4.4 percent in the final quarter of 2013, resulting in 4 percent full-year growth for 2013, the Turkish Statistical Institute (TurkStat) said in a recently released statement. Beating expectations amidst a turbulent regional setting and increasing global uncertainties, the 4.4 percent growth in Q4 2013 represents the 17<sup>th</sup> consecutive

quarter in the Turkish economy's growth trajectory. Far exceeding the EU economies in GDP growth rate for the last year, Turkey's economy hit USD 820 billion in size at current prices.<sup>3</sup>

Commenting on the growth figures, Turkey's Minister of Finance Mehmet Simsek said that the expansion was primarily fuelled by domestic growth. "Despite the negative conjuncture, Turkey has achieved strong growth performance, even exceeding the Medium Term Program forecast of 3.6 percent, becoming one of the top 10 fastest growing economies in the world.", Minister Simsek said in a statement.

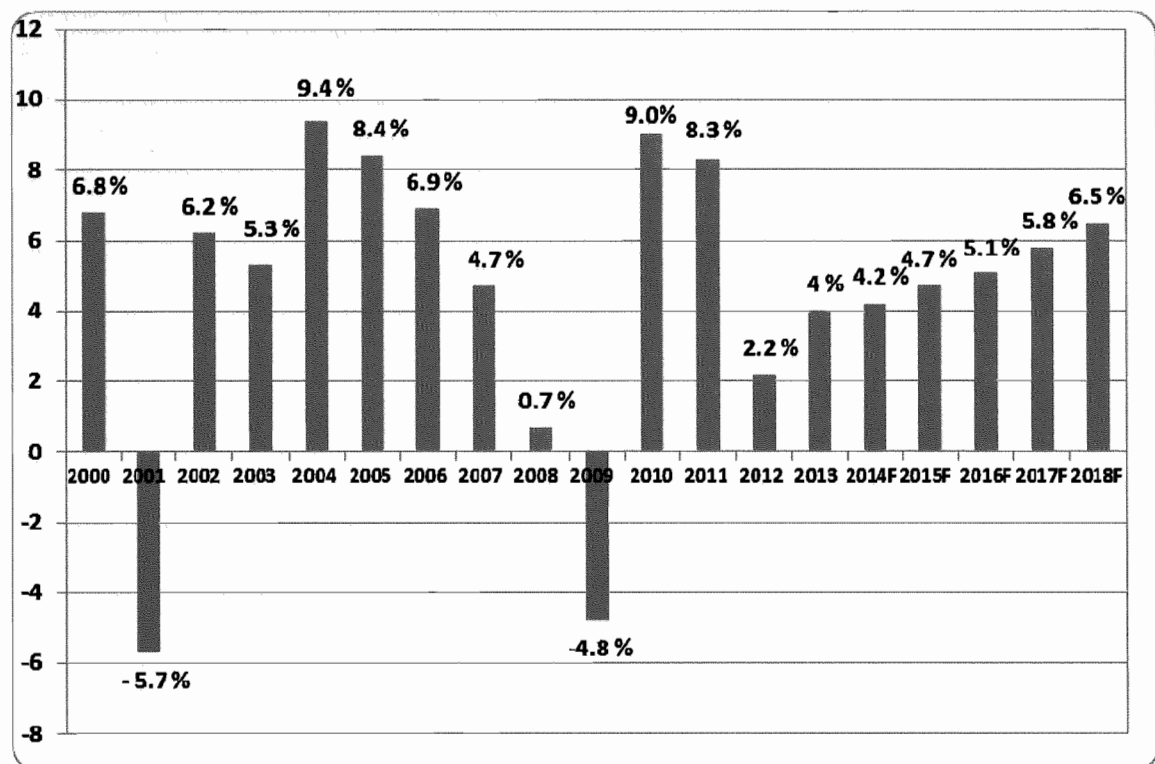


Chart 1: Real GDP growth for the period 2000 ÷ 2018 (including estimates)<sup>4</sup>

Commenting on the higher-than-expected growth, Turkey's Minister of Economy, Zafer Caglayan said that Turkey had managed to become one of the fastest growing economies in Europe and also among the G20 nations and the members of the Organization for Economic Cooperation and Development (OECD), Caglayan said in a written statement.

Turkey emerged as one of the fastest growing economies in the post-crisis period reaching impressive growth rate figures of 9 and 8.3 percent in 2010 and 2011 respectively, followed

<sup>3</sup> <http://www.invest.gov.tr/en-US/Infocenter/news/Pages/020414-turkey-2013-gdp-growth-4-pct.aspx>

<sup>4</sup> <http://www.turkstat.gov.tr/Start.do>

by 2.2 percent growth in 2012. The country's average economic growth in the 2012-2017 period may reach 5.2 percent according to a forecast by the OECD.

Turkey has a population of 78 million in which median age of the population is under the age of 30.1 years. Growth rate of population is 1.3% in Turkey, 0.3% in EU Countries and -0.2% in Germany.

The 2012 was unusual year for Turkey, as growth was entirely driven by net exports and the positive output gap was reduced significantly without a contraction in overall GDP. But the first half of 2013 saw a more standard growth pattern with domestic demand leading the way, pushing imports up by 10 percent y-o-y. In addition, and despite relatively resilient exports, the current account deficit has been gradually widening, in part due to the normalization in the net gold balance after last year's exceptional surplus.

In the year-to-date, the current account deficit has reached US\$44.3 billion, compared with US\$35.4 billion over the same period last year. The deficit is financed mostly by short term flows, with very little contribution of FDI flows so far in 2013, and a significant increase in portfolio in flows despite some recent pullback. Inflation is also accelerating, reaching 7.9 percent y-o-y in September compared with 6.2 percent at the end of last year. Core inflation measures also accelerated to about 7½ percent.<sup>5</sup>

Banks continue to perform well. Non-performing loan ratios remain low at about 3 percent, although NPLs are slightly higher in more recent loan vintages. Including loans that were restructured before becoming non-performing, the ratio of "problem" loans reaches around 2.84 percent of total loans. With asset quality good, bank profitability was strong in the first half of the year. Even with the recent tightening of monetary policy net interest margins remain at 4 percent, and return on equity close to 17 percent. Turkish GDP growth has strongly outperformed the EU-27 countries average<sup>6 7</sup> and is forecasted to speed up again in 2014 and a few years beyond.

Turkey's exports in May 2014 rose by 5.8 percent compared to the same month of the previous year and reached an all-time high of USD 13.4 billion, while the export total for the

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<sup>5</sup> <http://www.imf.org/external/pubs/ft/scr/2013/cr13363.pdf>

<sup>6</sup> <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>

<sup>7</sup> <http://www.turkstat.gov.tr/Start.do>



first 5 months of the year climbed to USD 67.9 billion, a solid 8 percent increase from a year earlier.<sup>8</sup>

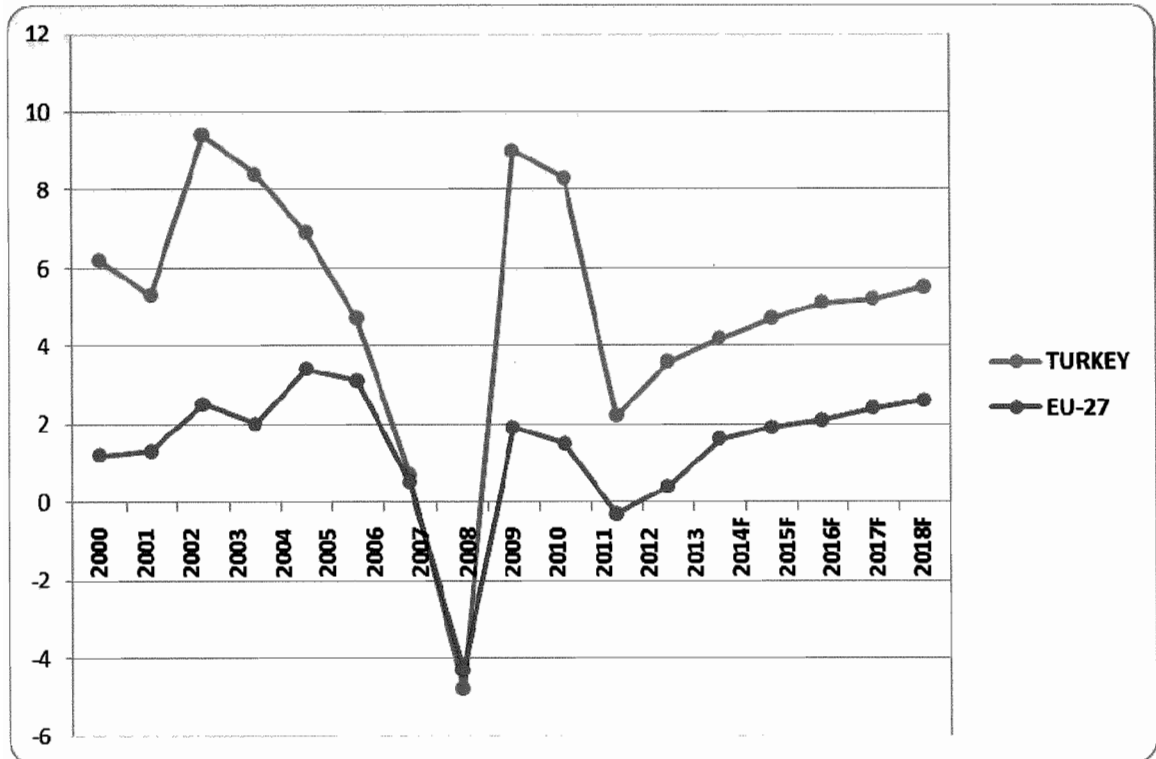


Chart 2: Turkish GDP growth compared to EU-27 for the period 2000 ÷ 2018 (including estimates)

According to data released by the Turkish Exporters Assembly (TIM), the automotive industry led the country's exports with USD 2.5 billion last month, followed by the ready-wear and textiles sector with USD 1.6 billion. The chemicals industry came third with USD 1.5 billion.

Turkey's GDP growth rate for 2014 will be no less than 4 percent thanks to rising exports, according to the country's Minister of Economy, Nihat Zeybekci.

Speaking at Turkey's Investment Summit 2014, organized by the Sovereign Wealth Fund Institute (SWF Institute) in partnership with the Investment Support and Promotion Agency of Turkey (ISPAT), Zeybekci pointed to the indicators of strong growth. "Capacity utilization has increased by 5 percent in the first quarter while exports went up by 10 percent. Exports will account for 2.5 percent of annual growth, clearly showing that Turkey is on an export-

<sup>8</sup> <http://www.invest.gov.tr/en-US/Infocenter/news/Pages/050614-turkey-exports-up-8-pct-jan-may-2014.aspx>

driven economic expansion trend,” he remarked, saying 2014’s growth rate will reach at least 4 percent.<sup>9</sup>

In the near term, Turkish growth is likely to be underpinned by robust domestic consumption. Even with the ongoing efforts on the part of the Central Bank to contain the expansion of bank credit, we expect consumption to rise, with risks still on the upside. Consumer demand has been above all driven by increasing disposable incomes. Turkish economy is expected to grow at a rate close to 5 % until 2018.

#### 4.4 ELECTRICITY IMPORTS AND EXPORTS. ELECTRICITY PRICES FOR BUSINESS AND HOUSEHOLDS

Demand for electricity in Turkey has been growing faster than the supply in recent years and the country has begun to import electricity.

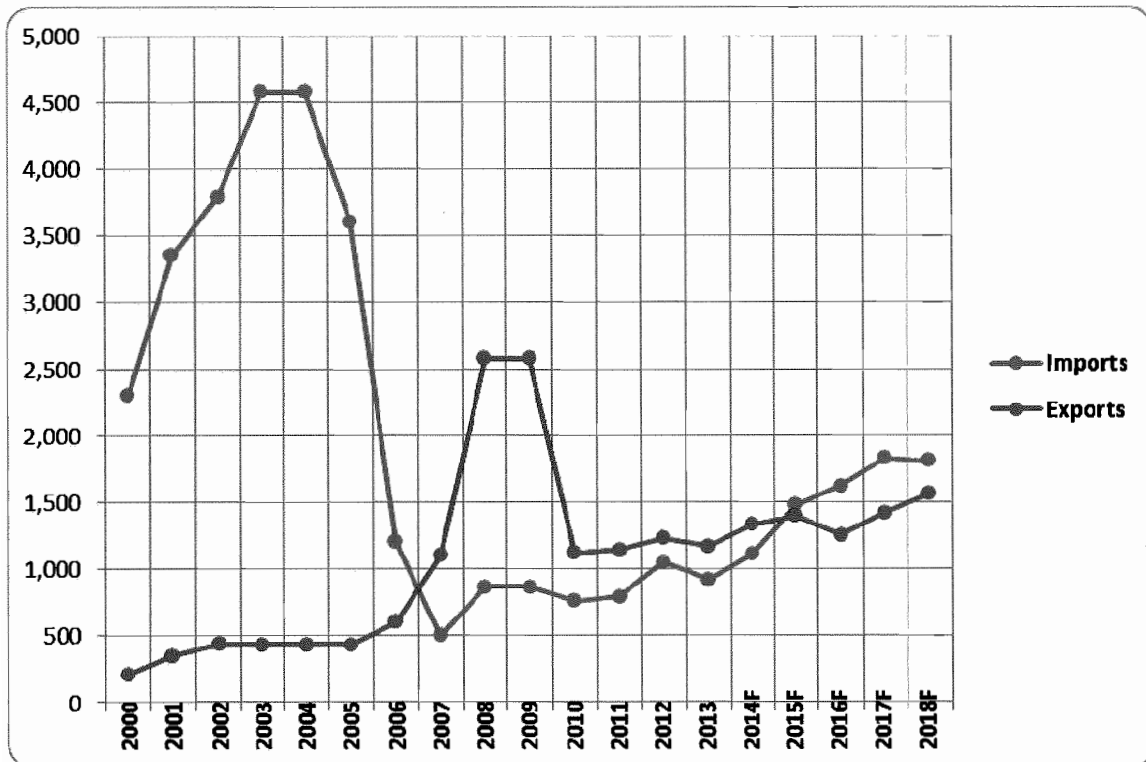


Chart 3: Electricity imports and exports for the period 2000 ÷ 2018 (in million MWh) including estimations<sup>10</sup>

<sup>9</sup> <http://www.invest.gov.tr/en-US/infocenter/news/Pages/210514-turkey-growth-export-driven-economy-minister.aspx>

<sup>10</sup> <http://www.indexmundi.com/turkey/>

Main reasons for the electricity shortage are lack of foreign investments, long investment periods required to establish power plants, insufficient government budget for rehabilitation and expansion in electricity production capacity and problems in natural gas procurement for natural gas power plants. According to studies conducted by Ministry of Energy and Natural Resources (MENR), Turkey will need additional about 25,000 MW electricity capacities by 2016 in order to meet the increasing demand for electricity. This additional capacity translates itself into annual infrastructure and capacity increase investments of at least USD 3 billion per annum.

Currently, natural gas captures the largest share in electricity production among other sources with 49 % share. As Turkey is dependent on imports for its natural gas cost procurement, high natural gas costs create a risk for electricity costs and hence prices. For more information on the development of the electricity import / export market, please refer to Chart 3 above.

Electricity prices for the business and households are as follows:

User types	Consumption	Prices per kWh
Households	< 2,500 and < 5,500 kWh/year	0.122
Business	> 500 and < 2,000 MWh/year	0.079

**Table 1: Electricity prices for business and households<sup>11</sup>**

**Notes:** - End-user price, excluding VAT. - Price data for non-Eurozone countries like Turkey are in euro. The average exchange rate valid for the referenced month is applied. - Amount is in euro (€) per kiloWatt-hour (kWh)

## 4.5 TAXES

In Turkey, multi-tax system is applied. The Turkish tax regime can be classified under three main headings<sup>12</sup>.

### 4.5.1 VAT

- VAT in Turkey is 18 %; VAT varies between 1 and 18 % for different cases

<sup>11</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Energy\\_price\\_statistics#Household\\_consumers](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_price_statistics#Household_consumers)

<sup>12</sup> <http://www.invest.gov.tr/en-US/investmentguide/investorsguide/Pages/Taxes.aspx>

- There are treaties for avoidance of double taxation with more than 70 countries.

#### **4.5.2 Income and Corporate Taxes**

- The standard corporate tax in Turkey is 20 %.
- The personal income tax rate varies from 15% to 35%.
- Tax on dividends is 15 %

## 5 WORLD PHOTOVOLTAIC MARKET OVERVIEW

The current levels of dependence on fossil fuels, the need of reducing the carbon emissions associated with energy use and the prospects of developing a new and extremely innovative technology sector, make photovoltaics increasingly attractive. It is essential that photovoltaic energy and renewable energy sources are increasingly used as a part of the worldwide strategy to improve the security of the energy supplies and reduce the impact of energy production and consumption.

For the first time in history, the five top sources of newly installed electricity in Europe in 2013 were renewables, with hydropower, biomass and thermo-solar (CSP) following wind and PV. The decline of gas has to be understood in a context of stable electricity demand in Europe in the last decade, existing overcapacities in some regions of Europe, as well as the low price of wholesale power and competition from coal experienced in the last few years.

### 5.1 GLOBAL PHOTOVOLTAIC MARKET GROWTH AND FUTURE DEVELOPMENT TRENDS

The annual global revenue of the PV market will reach \$134 billion by 2020, according to the report from the US market research company Navigant Research.<sup>13</sup> The report predicts that the newly installed global PV capacity from 2013 to 2020 will be of 430 GW and that by the end of 2020 PV will be cost-competitive with retail electricity prices in a significant portion of the world.<sup>14</sup>

#### Market development in 2013

Even during a difficult period of industry consolidation and economic crisis, PV installations saw another record-year in 2013: at least 38.4 GW of newly-added capacity around the globe, and almost 11 GW in Europe. While the latter figure represents a significant decrease compared to the year before, it should however be put into perspective. In 2013, apart from wind, no other source of electricity reached the levels of new installations that PV did in Europe. Some, such as gas, even experienced negative net numbers, with more capacity decommissioned than installed. The global PV market progressed in 2013: after two years of around 30 GW of new installations annually, the market reached more than 38 GW in 2013,

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<sup>13</sup> <http://www.navigantresearch.com/newsroom/worldwide-solar-pv-market-will-surpass-134-billion-in-annual-revenue-by-2020>

<sup>14</sup> [http://www.photon.info/photon\\_news\\_detail\\_en.photon?id=78476](http://www.photon.info/photon_news_detail_en.photon?id=78476)

establishing a new world record. But the most important fact from 2013 is a rapid development of PV in Asia combined with a sharp drop of installations in Europe. Thus in 2013 global cumulative installed capacity reached 138.9 GW.

According to EPIA for the third year in a row, PV in 2013 was amongst the two most installed sources of electricity in the European Union. While wind energy exceeded PV in 2013 by some hundreds of MW, these two sources of electricity are the clear leaders of new generation sources of installations. PV now covers 3% of the electricity demand and 6% of the peak electricity demand in Europe. As the share of PV in the electricity mix increases, grid and market integration challenges are becoming more and more important for the future development of PV.<sup>15</sup>

At the end of 2009, the world's cumulative installed PV capacity was more than 23 GW. One year later it was 40.3 GW and at the end of 2011 it was 70.5 GW. In 2012, the 100 GW mark was reached and by 2013, almost 138.9 GW of PV had been installed globally —an amount capable of producing at least 160 terawatt hours (TWh) of electricity every year. This energy volume is sufficient to cover the annual power supply needs of over 45 million European households. This is also the equivalent of the electricity produced by 32 large coal power plants. The global cumulative installed capacity could have even reached 140 GW in 2013 if the additional 1.1 GW in China were taken into account.

Europe remains the world's leading region in terms of cumulative installed capacity, with 81.5 GW as of 2013. This represents about 59% of the world's cumulative PV capacity, down from 70% in 2012 and about 75% of the world's capacity in 2011. Asia Pacific countries are growing fast, with 40.6 GW now installed. Next in the rankings are the America's (13.7 GW).

Many of the markets outside the EU - in particular the USA or India - have tapped only a very small part of their enormous potential. In 2013, Asian countries took the lead and started to develop faster than traditional European markets. Several countries (incl. Turkey) from large "Sunbelt" regions like Africa, the Middle East, South East Asia and Latin America are on the brink of starting their development. The cumulative installed capacity outside Europe almost doubled from 30 GW as of 2012 to close to 60 GW in 2013, demonstrating the ongoing rebalancing between Europe and the rest of the world and more closely reflecting the patterns in electricity consumption.

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<sup>15</sup> <http://www.epla.org/news/publications/>

### **Increasing competitiveness of PV industry and “grid parity”**

PV markets in Europe and around the world continued making rapid progress in 2013 toward competitiveness in the electricity sector. The strong price decreases of PV technology, and increased electricity prices in general, have helped drive momentum toward what is often called “grid parity”. The moment is near when the savings in electricity cost and/or the revenues generated by selling PV electricity on the market could be equal to or higher than the long-term cost of installing and financing a PV system.

This so-called “dynamic grid parity” appears within range in several EU countries, and has been reached already in some segments of some countries. In most countries, PV market deployment still depends on the political framework in place. Various national schemes – whether they are being introduced, modified, or phased out – have a significant influence on EPIA’s forecasts and scenarios as they have serious consequences on national PV markets and industries. As shown by the substantial regulatory changes introduced by policymakers in several countries in 2012, dedicated financial support as the main driver for PV development is progressively vanishing. In the coming years, deployment strategies will depend much more on the capacity of PV power to actively participate in the electricity system.

### **Feed-in tariffs lose their power**

Under a feed-in tariff policy, governments set prices (often at a premium) for different types of renewable power to compensate producers for the higher cost of producing clean energy. Utilities are then required to purchase power from renewable resources at this price—but have the option of either spreading the additional costs across their entire customer base or receiving compensation from the government to recover the incremental costs. Feed-in tariffs thus essentially subsidize renewable energy sources to make them cost-competitive with fossil-fuel-based technologies.

Although feed-in tariff policies have gained worldwide popularity, their cost effects have become a primary concern for policy makers in many countries. Whether the rising costs are recovered from ratepayers or taxpayers, they can create both political and economic pressures. Households in developing countries are particularly vulnerable to rising tariffs, as spending on energy accounts for a larger share of their incomes than for households in

developed countries. According to recent study of World Bank<sup>16</sup> higher subsidies have not necessarily yielded greater levels of renewable installation. We may expect in the next five years to 2018 that feed-in tariffs will continue to lose their power and will put uncertainty as an instrument to stimulate investments in photovoltaic installations.

### Market development forecast to 2018

Europe has dominated the global PV market for years but the rest of the world clearly has the biggest potential for growth. While European electricity demand is stagnating, this is not the case globally and PV growth will continue to be driven by local and global energy demand. The fastest PV growth is expected to continue in China and South-East Asia in general, with Latin America, Turkey, the MENA countries and India following.

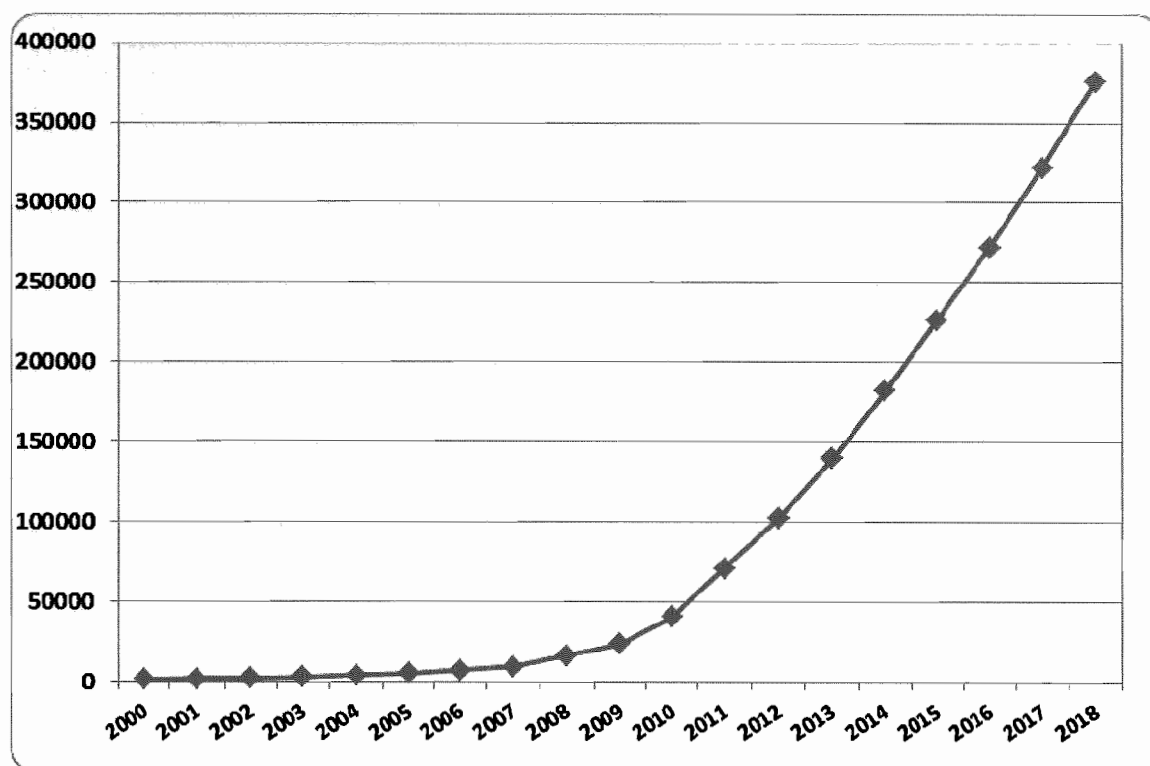


Chart 4: Global annual PV market forecast 2000 - 2018 (in MW), EPIA (medium case scenario)

The PV potential of the "Sunbelt" countries (incl. Turkey) where PV can already compete with diesel generators for peak power generation without financial support – could range from 60 to 250 GW by 2020, and from 260 to 1,100 GW in 2030. And with the faster than

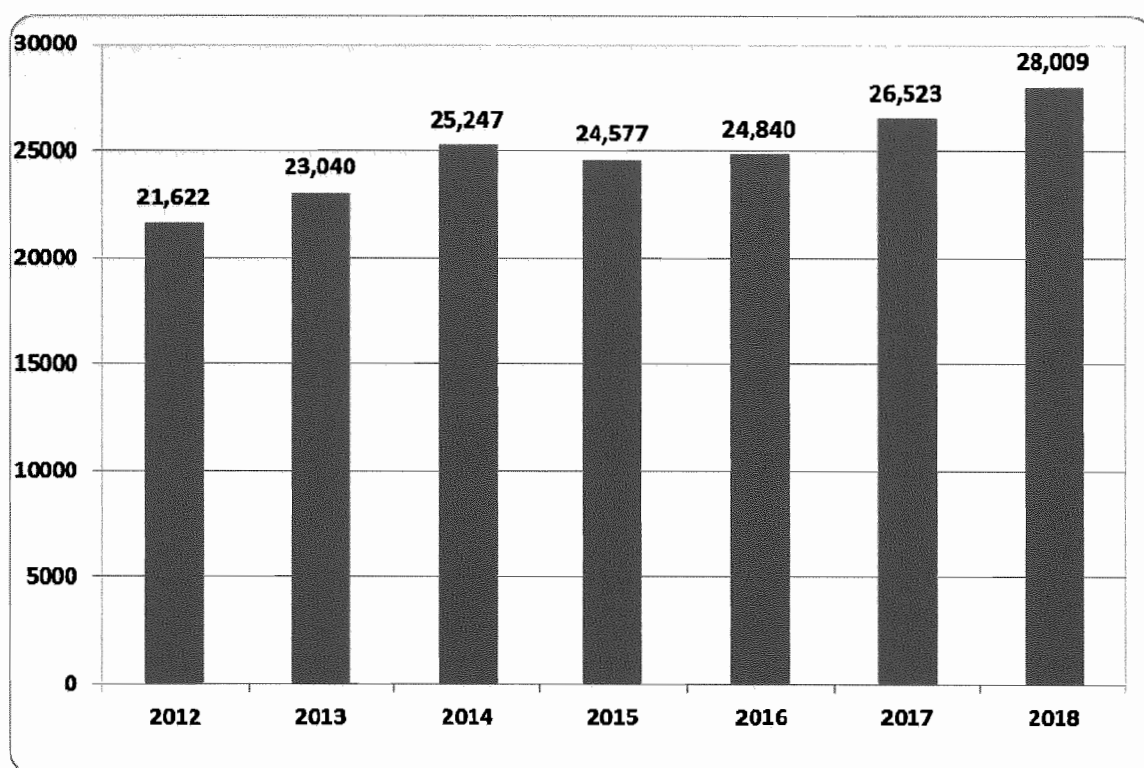
<sup>16</sup> <http://documents.worldbank.org/curated/en/2013/02/17390570/fit-feed-in-tariff-policies-evidence-european-wind-market>



expected price decrease that the industry experienced in 2011 and 2012, even more countries will see PV becoming competitive before the end of this decade.

More than 27 GW of new installations of PV systems occurred outside Europe in 2013, compared to 13.9 GW in 2012, 8 GW in 2011 and 3 GW in 2010. The rapid development of China's PV market allowed it to take the first position among these countries, followed by a booming Japan (6.9 GW) and the USA with 4.8 GW. All three are expected to continue at the same level or even slightly more in 2014, with China probably above 10 GW for several years.

Australia expanded rapidly in 2011 and 2012 with around 1 GW of new installations, but decreased to 830 MW in 2013. India installed more than 1 GW, finally realizing a (small) part of its huge potential.

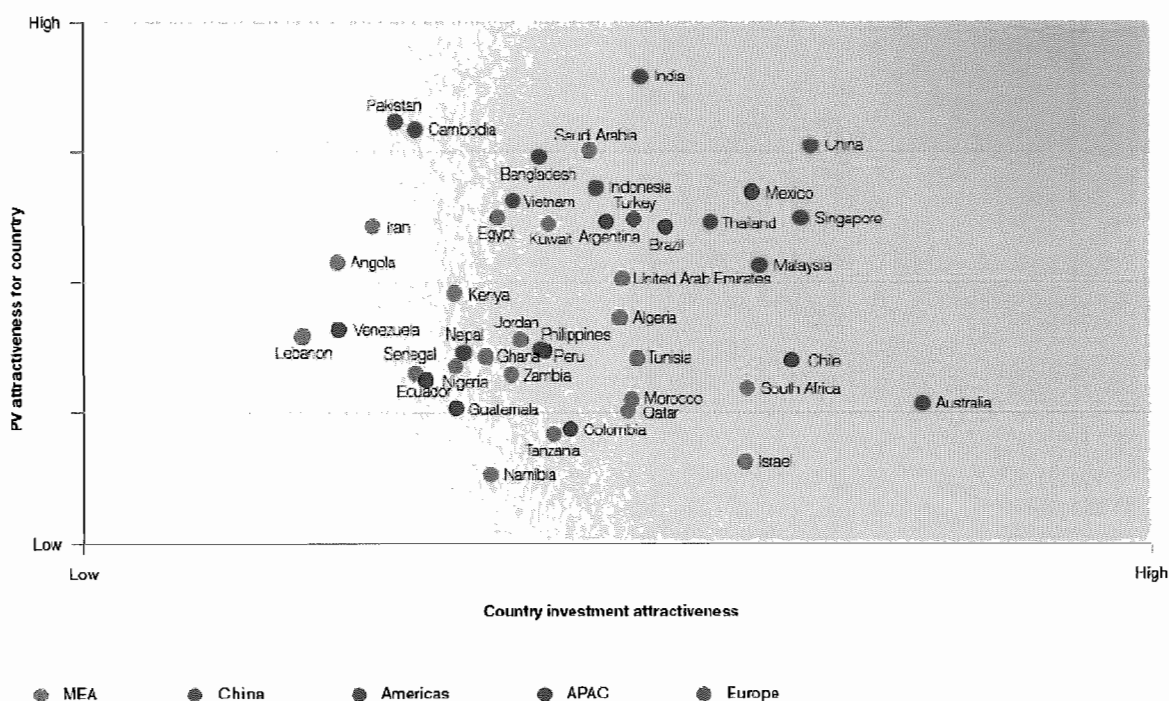


**Chart 5: Global Rooftop Photovoltaic Development Scenario 2012 – 2018 (in MW), EPIA (medium case scenario)**

In Korea, 442 MW were installed, a sign that the market has restarted but remains rather low, constrained by a quota system and some additional incentives. Some other countries experimented with embryonic PV markets: Taiwan had a 170 MW target for 2013 while Thailand, with a huge pipeline of projects, commissioned 317 MW, and Malaysia, where

several manufacturers are producing, appears on the map with 57 MW. In the Americas, Canada has expanded with 444 MW and Mexico and Peru installed several MW. Brazil and Chile, with their huge potential, have not commissioned many systems yet but the huge pipeline of potential projects in Chile should bring dozens of MW online in 2014. In the Middle East region, Israel remains the only country with a significant market (420 MW in 2013), while Saudi Arabia showed in 2012 and 2013 some interest for PV development that hasn't yet materialized.

The surpassing of the 100-GW mark in terms of cumulative global PV capacity in 2012 represents a major achievement of the PV industry in just a few years. In the low scenario of EPIA, the global market could remain between 35 and 39 GW annually in the five coming years between 2014 and 2018.<sup>17</sup> The combination of declining European markets and the difficulty of establishing durable new markets in emerging countries could cause this market stagnation.



**Chart 6: Unlocking the Sunbelt Potential of Photovoltaics, 2013 update, EPIA**

While the decline of PV system prices in most markets paused in 2013, the installations that were triggered before that pause compensated for the EU decline. Most important markets outside Europe grew in 2013 and without these lost GW in Europe, the global PV market

<sup>17</sup> <http://www.epia.org/news/publications/>

growth would have been even more impressive and reached well above 40 GW. This clearly illustrates how PV remains a policy-driven business, where political decisions influence considerably the potential market off-take.

In 2013 the rooftop segment represented more than 23 GW of total installations, higher than in 2012. With projections of more than 35 GW installed by 2018, this segment should experience stable growth from a global point of view. However, the world PV installation segmentation is changing: last year in a low scenario of EPIA more than 27 GW were expected to be installed in the rooftop segment by 2017.

This year (2014), expectations have been lowered to slightly above 20 GW which means a stable market until 2018. This can be explained by a shift towards utility-scale plants in the “Sunbelt” markets, due to a different nature of the investors and less opposition to ground-mounted PV systems than in Europe. With the development of PV in the markets, which have reached or will reach soon “grid parity”, EPIA expects utility-scale plants to grow much faster than rooftop applications.

## 5.2 PV MODULES AND PV SYSTEMS COSTS

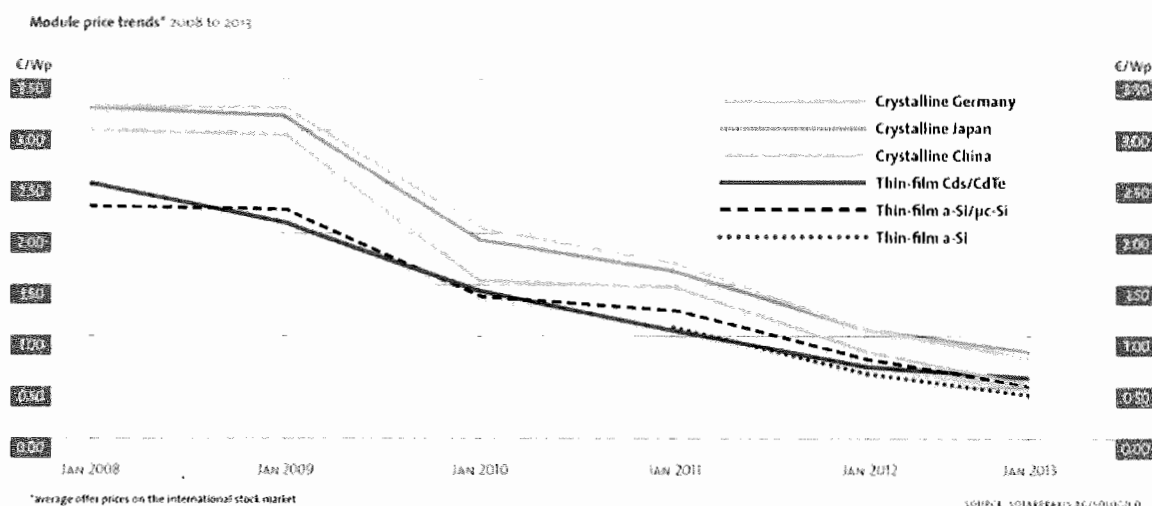
Photovoltaic electricity costs are becoming more and more competitive. According to an analysis conducted by the consultancy agency McKinsey, during the period of the next 3 to 7 years, the price of the unsubsidized electricity from solar sources will fall considerably for the end consumer, reaching the values of energy produced from coal, gas or petrol products. The consultants also anticipate that by 2020, the globally installed solar installations will grow with up to 40%, which will lead to the significant price reduction of the energy produced from them.

The market’s most important driving forces are the falling system costs of photovoltaics and the increasing price of electricity generated using conventional technologies. While solar module prices could stabilize in 2013 system costs are more likely to change.<sup>18</sup> EPIA estimates that the price of PV systems belonging to the utility-scale sector (2.5 MW and above) will fall by a quarter within the next ten years, from 1.22 euros per watt (W) in 2012 to 0.92 euros per W in 2022. Module prices stabilized during 2013 as a result of existing overcapacities disappearing from the market.

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<sup>18</sup> <http://www.pv-power-plants.com/industry/heading-for-new-dimensions/>

The price of other important components, such as inverters and sub structures, is also falling, a development that is fuelling the worldwide boom in large-scale solar power plants and small roof-mounted systems alike. On the other end of the spectrum, the fuel costs of conventional power plants are increasing, causing power generation costs to rise with them. This is making the solar park market segment progressively more lucrative for financially strong investors – even in the face of tumbling feed-in tariffs.<sup>19</sup>



**Chart 7: PV module price trends from 2008 to 2013 (€/Wp), SolarPraxis/Sologico**

Solar power generation is already economically viable in southern countries such as Spain, Italy, Turkey and Greece. Installation costs are falling steadily and, despite a lack of feed-in tariffs, investing in photovoltaics is becoming lucrative in many places – particularly in installations where grid parity has become tangibly close to being met or has even been exceeded. This trend was observed worldwide during 2012 and 2013, and is likely to continue in 2014.

<sup>19</sup> <http://www.pv-power-plants.com/industry/headling-for-new-dimensions/>

## **6 COMPARATIVE ANALYSIS OF PHOTOVOLTAIC MARKET GROWTH IN SELECTED SEE COUNTRIES**

### **6.1 COUNTRY PROFILES**

#### **6.1.1 BULGARIA**

Development of operational PV plants in Bulgaria started with very moderate steps in 2007, but progressed with fast paces after the second half of 2010 when appropriate legislative and regulatory changes were made from the government. Mandatory target for solar installations according to National Renewable Energy Action Plan (NREAP) of 303 MW by 2020 was exceeded more than 3 fold and reached 1,013 MW (1.013 GW) cumulative installed PV capacity at the end of 2013. This booming development was similar to Czech and Slovakian way of market development. Public strikes against high and continuously rising electricity prices forced Bulgarian government to resign in the winter of 2013. Since the Q4 2012 feed-in tariffs, subsidies and support for photovoltaic projects above 200 KW have been significantly reduced.

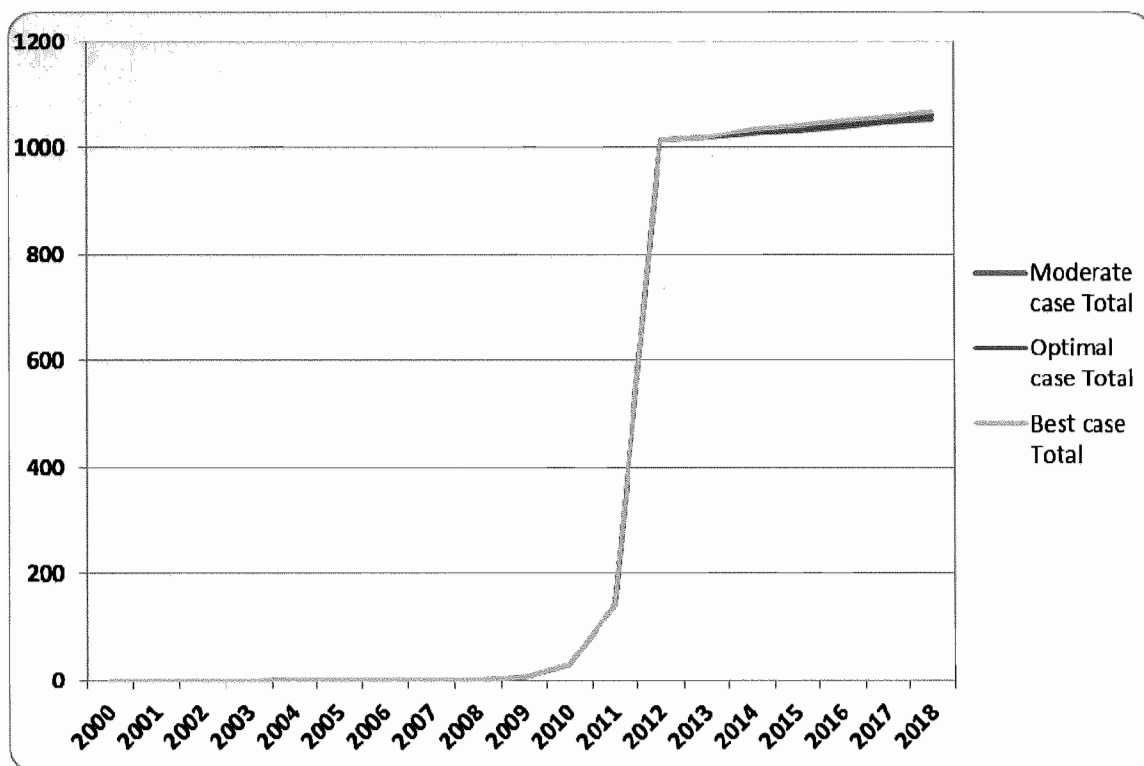
The feed-in tariffs in Bulgaria are financed via a “green energy fee” which is paid by all consumers of electricity – households and industries, in the country. The fee is included in their monthly electricity bills. Thus, the participating utility companies are supporting the feed-in tariff in the country to a great extent with taxpayer’s money instead of with investments. NEC, TSO and DSO’s allocates the proceeds from the tariffs in order to reimburse all private utility companies for any additional costs incurred by the acquisition of energy at feed-in tariff.<sup>20 21</sup>

Bulgarian photovoltaic market for ground based installations above 200 KW is definitely in mature phase of its development. New green filed development initiatives and projects have been significantly reduced after the middle of 2012 due to the reduction of feed-in tariffs. For this reason BIPV segment including façade and rooftop residential installations with up to 30 KW capacity and industrial installations with less than 200 KW capacity will be the main driver of the moderate growth forecasted in Bulgaria for the years between 2014 and 2018.

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<sup>20</sup> <http://www.bltz.bg/news/article/52531>

<sup>21</sup> <http://www.stroitelstvo.info/show.php?storyid=732933>



**Chart 8: Cumulative development forecast of photovoltaic power plants in Bulgaria in MW from 2000 to 2018; Source: Inea Consulting Ltd.**

Most of the largest deals on Bulgarian PV market were registered in 2012. In the beginning of March 2012, 42 MW solar projects Samovodene and Zlataritsa of South Korean company SDN have been launched into operation<sup>22</sup>. According to information from company officials their investment volume is € 100 mln., and was supported by Korean Export Development Bank.

American industry leader SunEdison built and launched into operation at the end of March 2012 photovoltaic park with 50 MW capacity for € 181.4 mln. near Karadzhzalovo village, Plovdiv region with financial support of IFC.<sup>23</sup> <sup>24</sup> Italian company Moncada Energy Group launched 16 MW photovoltaic power plant in Oriahovo village, planned to start operation in June 2012<sup>25</sup>.

<sup>22</sup> <http://www.mi.government.bg/bg/news/julieta-hubenova-fotovoltaihnite-parkove-zlatarica-i-samovodene-sa-nai-golvamata-koreiska-invest-553.html>

<sup>23</sup> <http://www.ifc.org/ifcext/spiwebsite1.nsf/DocsByUNIDForPrint/889E999A7BCAE07F8525798B006F00AF?opendocument>

<sup>24</sup> [http://www.capital.bg/politika\\_i\\_ikonomika/bulgaria/2012/03/29/1798208\\_kalifornijski\\_izgrev\\_nad\\_karadzhalovo/](http://www.capital.bg/politika_i_ikonomika/bulgaria/2012/03/29/1798208_kalifornijski_izgrev_nad_karadzhalovo/)

<sup>25</sup> [http://www.capital.bg/biznes/2012/04/10/1805584\\_italanci\\_investirat\\_29\\_mln\\_evro\\_v\\_solaren\\_park/?ref=embed&source=www.dnevnik.bg](http://www.capital.bg/biznes/2012/04/10/1805584_italanci_investirat_29_mln_evro_v_solaren_park/?ref=embed&source=www.dnevnik.bg)

### 6.1.2 GREECE

One of the core components of Greece's energy profile will be solar, or photovoltaic, energy. Greece has a superb sun radiation capacity and it is estimated that one third of Greece's energy requirements could be met with solar.<sup>26</sup>

Greece ranks 5<sup>th</sup> worldwide with regard to per capita installed PV capacity. 4.5 billion € were invested in PV in Greece during the last 5 years. This is 35% higher than the cumulative amount invested in all other RES technologies during the last 20 years. In 2012, PV covered 3% of electricity demand in Greece. In 2013, solar share reached 6%. For a small country in an unprecedented financial crisis, this performance is indeed amazing. There is a very good reason for this: a brave support mechanism. Greece has been offering high feed-in-tariffs (FiTs) for PV since 2006. This has sky rocketed the market, especially during the period 2011-2013, and reached a cumulative installed PV capacity of 2.3 GW in the middle of 2013.<sup>27</sup>

However, this very mechanism has also overheated the market. High feed-in-tariffs and dramatic decreases of PV costs since 2011 have led to a boom that the Electricity Market cannot sustain anymore. The Electricity Market Operator was not possible to raise the necessary funds for compensating the 2.5 GWp of PV installed so far (hence there are delays in payments of the feed-in-tariffs). As a result of cash flow problems of the Market Operator, the Greek authorities have taken drastic measures against existing and future PV installations, since August 2012:

- **A temporary tax, ranging between 25% and 42%, has been imposed to all operating PV plants (residential systems excluded).**
- **Licensing process for new PV projects has been put on halt (residential systems excluded).**
- **Feed-in-tariffs (FiTs) for new PV plants have been reduced in 2013 to 125 €/MWh for residential systems (<10 kWp), 120 €/MWh for small commercial systems (<100 kWp) and 95 €/MWh for large systems (>100 kWp), with a further drastic digression planned for the years to come.**

The average wholesale cost of electricity in Greece is ca.75 €/MWh, with the cost of gas plants exceeding 110 €/MWh. Obviously, a solar kWh compensated with the new FiTs costs

<sup>26</sup> <http://www.investingreece.gov.gr/default.asp?pid=36&sectorID=49&la=1>

<sup>27</sup> [http://www.helapco.gr/The\\_Greek\\_PV\\_Market.html](http://www.helapco.gr/The_Greek_PV_Market.html)

less than a KWh generated by a gas-fuelled power plant, reducing, simultaneously, country's CO2 emissions.

The halt on the licensing process however does not allow for the time-consuming development of new greenfield large scale ground mounted projects and medium-size rooftop projects, which could become viable mid-term through economies of scale and/or reduced CAPEX and OPEX. Therefore, restart of the market cannot be envisaged soon.<sup>28</sup>

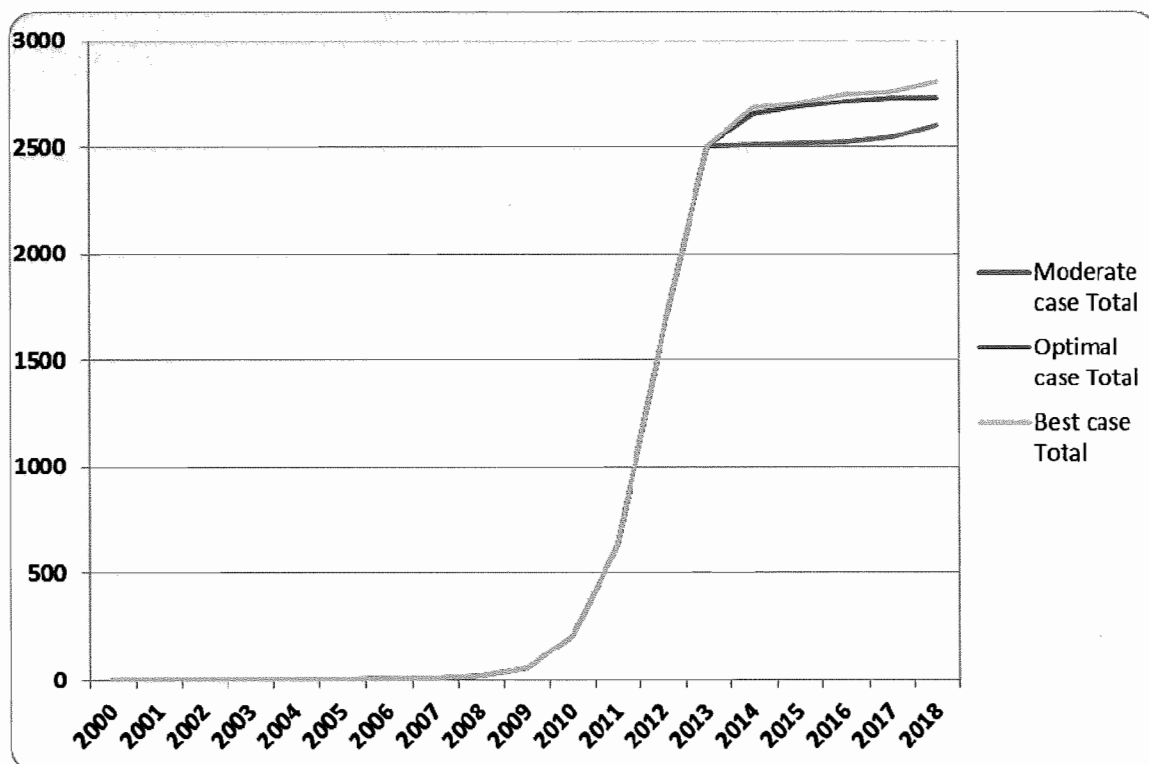


Chart 9: Cumulative development forecast of photovoltaic power plants in Greece in MW from 2000 to 2018; Source: Inea Consulting Ltd.

Sky Solar announced at the end of March 2013 successful grid-connection of integral 40MW and 30MW photovoltaic projects in Greece.<sup>29</sup> A Chinese solar energy developer has connected a 70MW power plant to the grid in Greece. Hong Kong firm Sky Solar has announced the successful grid-connection of the integral power plant in the European country, which composes of 40MW and 30MW project packages. The 40MW project was grid-connected on 28 January 2013, while the 30MW project was grid-connected on 12

<sup>28</sup> [http://www.helapco.gr/The\\_Greek\\_PV\\_Market.html](http://www.helapco.gr/The_Greek_PV_Market.html)

<sup>29</sup> <http://www.renewable-energy-technology.net/solar-energy-news/chinese-solar-firm-connects-70mw-pv-power-plant-greek-grid>



March 2013. Development work from Sky Solar included design, investment and financing, construction and grid-connection. The two projects are entitled to a 20-year Greek PV FiT subsidy

### 6.1.3 ROMANIA

The use of solar PV systems in Romania by the end of 2011 was limited. Some governmental organizations used PV in remote services areas such as telecom stations, solar lighting solutions, forest fire observation towers and highway emergency. From the map above is visible that large parts of Romania are exposed to sunlight most of the year, making solar energy a viable choice for photovoltaic power generation.

The photovoltaic development in Romania was started with small scale photovoltaic installations below 30 KW in 2006. In opposite to the rapid expansion of wind market, the photovoltaic power capacity remained relatively unchanged and reached only 3 MW at the end of 2011 and 29 MW at the end of 2012. This represented insignificant share of the overall electricity generation capacity of Romania. With the introduction of support mechanisms in the law in 2008 and the subsequent amendments in 2010, 2011 and 2012, Romanian photovoltaic energy market started growing since the second half of 2012. The country made impressive jump and cumulative photovoltaic installed capacity of 29 MW for 2012 as only for one year this capacity exceeded 1,031 MW (1.031 GW) by the end of 2013, which is more than 30 fold increase from 2012 level.

It should be noted that Romanian Photovoltaic Industry Association (RPIA) played key role for the proper establishment of Romanian photovoltaic market. RPIA negotiated with Government together with other stakeholders and investors the most important changes in law from the half of 2012, which made possible first sizeable and landmark photovoltaic parks to start construction in Romania.

Solar photovoltaic projects are currently granted with **3 green certificates (GCs)** per 1 MWh since the beginning of 2014. In 2012 and 2013 solar photovoltaic projects have been **granted with 6 GC's**. This cut of the number of green certificates was consequence of 3 main reasons: i) the exceeding of almost 4 fold the government target of 280 MW for solar installations by 2020 in NREAP; ii) decrease in the cost of photovoltaic energy average turnkey installation cost; iii) protests of large industrial factories that their production will

become uncompetitive due to green additive in the prices of electricity; iv) fears of Romanian government that exceeding of 280 MW solar quota according to NREAP may reflect to increase of prices of electricity for households and businesses and that Romania couldn't afford to pay for so big photovoltaic capacity, without overheating the country's budget.

Producers of RES-E and energy suppliers may trade green certificates on both centralised green certificates market and on the market of bilateral agreements of green certificates. Such markets are administered by Romanian green certificates market operator OPCOM. For the period 2008-2025, a green certificate may be traded within a minimum value for 2012 of € 27/MWh and a maximum value of € 55/MWh. These values are adjusted yearly by ANRE according to the average annual inflation index, calculated by Eurostat.<sup>30</sup> Besides from green certificates producers of electricity from renewable energy sources in Romania benefit also from the sale of electricity on the free market. The price of electricity on the free market varies for the second half of 2013 between € 35/MWh and € 46/MWh. Therefore total purchase price for electricity from photovoltaic sources in Romania can vary between minimum of 116.<sup>00</sup>/MWh to maximum of €211.<sup>80</sup>/MWh. The weighted average price of a traded green certificates has fallen from € 54.44/MWh (RON 246/MWh) in December 2012 – February 2013) to € 41.38/MWh (RON 187/MWh) in January – March 2014, according to data from OPCOM.

The renewable sector and photovoltaic one particularly in Romania has grown pretty much from scratch in the last five years, attracting EUR 5 billion in direct investments, based on a green certificate support scheme, which has been vetted by the European Commission, the executive arm of the EU.<sup>31</sup>

The country's incentivized renewable capacities reached 4,412 MW at the end of January 2014, on the back of soaring investments in wind and solar capacities, although changes in the legal framework have put heavy brakes on new investments. According to grid operator Transelectrica, the wind sector had 2.704 MW, while the photovoltaic sector has grown to 1,077 MW. The hydroelectricity sector had 536MW, while biomass edged close to 100MW.<sup>32</sup>

<sup>30</sup> [www.mcgregorlegal.eu](http://www.mcgregorlegal.eu)

<sup>31</sup> <http://business-review.eu/featured/romanias-renewable-capacities-exceed-4400mw-by-january-2014/>

<sup>32</sup> <http://business-review.eu/featured/romanias-renewable-capacities-exceed-4400mw-by-january-2014/>

Romania and Bulgaria were among the EU countries who posted highest reductions of carbon emissions last year, according to an Eurostat survey. All 28 member states did their part to decrease carbon emissions in 2013, but the EU average was -2.5 percent. The drop is explained by the increase in renewable energy capacity contributing to reducing the reliance on fossil fuels, as well as various EU energy efficiency initiatives that aim to reduce emissions of CO<sub>2</sub> and other greenhouse gases.

From 2012 to 2013 CO<sub>2</sub> emissions from fossil fuel combustion decreased in nearly all member states, except Denmark (+6.8 percent), Estonia (+4.4 percent), Portugal (+3.6 percent), Germany (+2.0 percent), France (+0.6 percent) and Poland (+0.3 percent). The largest decreases were recorded in Cyprus (-14.7 percent), Romania (-14.6 percent), Spain (-12.6 percent), Slovenia (-12.0 percent), Bulgaria and Greece (both -10.2 percent).

The first two industrial scale solar power plants in the country by the end of 2011 were the Singureni Solar Park completed in December 2010, and the Scornicesti Photovoltaic Park, completed 27 December 2011. Each is 1 MW. Both power plants have been developed by Italian company Renovatio Group<sup>33</sup>, which has bundle of another 50 MW photovoltaic projects scheduled for construction.

Switzerland-based Hareon Alps Holding AG, a wholly-owned unit of Chinese Hareon Solar Technology Co Ltd (SHA:600401), will apply for loans of up to EUR 48 million (USD 58.8m) from China Development Bank (CDB), business information website Sinocast.com said on 20<sup>th</sup> July 2012. Hareon Alps Holding AG will use the financing to build a 122-MW solar power plant in Romania for a total cost of EUR 1.98 billion, according to Sinocast<sup>34</sup>.

Egnatia Romania has finalized the works and connected on the grid, the photovoltaic project of 1.7 MW owned by Romanian private company "Casa de Investitii ALIANTA". The project – which is situated in Lechinta village, Bistrita-Nasaud County – was connected to the national electricity grid on August 17, 2012<sup>35</sup>.

Romania is one of the major destinations for the Chinese investors in Central and Eastern Europe, as the Chinese companies want to enter the Romanian market, invest and perform economic activities in our country, in the traditional industries and fields such as

<sup>33</sup> [http://www.rnvgroup.com/fact\\_and\\_figures.php](http://www.rnvgroup.com/fact_and_figures.php)

<sup>34</sup> <http://renewables.seenews.com/news/hareon-solar-unit-to-seek-up-to-usd-60m-loan-from-cdb-report-290572>

<sup>35</sup> <http://www.egnatia-rom.ro/news.htm>

winemaking, bee-keeping, metallurgy, chemistry, solar and wind energy, wood processing and software industry, Ambassador of the People's Republic of China to Romania Huo Yuzhen said in an interview for Agerpres<sup>36</sup>.

Chinese photovoltaic modules producer Renesola entered the Romanian market by acquiring Romanian company Lucas Est<sup>37</sup>, which runs a photovoltaic park in the country, according to Wolf Theiss law firm, which assisted the buyer. Renesola is currently involved in due diligence and several acquisitions in Romania, according to the law firm. The value of the recent deal was not announced. Lucas Est runs the Dumbrava 6 MW photovoltaic park in Prahova county, on some 14 hectares of land. The project is at an advanced stage of development and most likely the photovoltaic plant will start producing energy and be connected to the national grid by the end of the year<sup>38</sup>.

EDP Renováveis (EDPR) announced that it has finished constructing in Q1 2013 its 39 MW PV project in Romania, working with its local partner, the Renovatio Group, EDP EDPR's project is located in the southern part of the country, where the irradiance is supposedly highest in Romania<sup>39</sup>.

China's ET Solar has won a contract to develop three photovoltaic plants totaling 50 MW in Romania as part of the surge into less developed Eastern European markets. The plants will be developed in the southern Romanian counties of Gorj, Giurgiu and Dolj in a contract with privately-owned energy company Tinmar\_Ind S.A.<sup>40</sup>. First 20 MW with construction has been completed at the end of 2012 and grid connected in the Q1 2013. Construction of the remaining 30 MW finished at the end of Q2 2013.

Gehrlicher Solar AG<sup>41</sup> in November 2012 completed construction of a 8.75 MW ground-mounted system for Ra Ra Parc SRL, the investor and operator in Isaccea<sup>42</sup>, eastern Romania.

According to Enel's business plan published at the middle of April 2012, the company started construction on 19 MW of PV installations in Romania at the end of February.

<sup>36</sup> <http://actmedia.eu/companies/romania-major-target-for-chinese-investors-in-central-and-eastern-europe/42011>

<sup>37</sup> <http://business-review.ro/featured/renesola-buys-6-mw-solar-park-in-romania/>

<sup>38</sup> <http://www.romania-insider.com/chinese-renesola-buys-romanian-photovoltaic-park/65617/>

<sup>39</sup> <http://www.pv-tech.org/news/edp-renovaveis-begins-construction-of-39mw-romanian-solar-plant>

<sup>40</sup> <http://www.pv-magazine.com/news/details/beltrag/romania-et-solar-wins-contract-for-50-mw-of-pv-plants-100009271/#axzz2DWyUwcmn>

<sup>41</sup> <http://www.gehrlicher.com/en/home/press/details/article/gehrlicher-solar-ag-to-build-first-9-mw-solar-park-in-romania/>

<sup>42</sup> <http://www.pv-tech.org/project-focus/isaccea-romania>

Overall, the Italy-based power company plans to expand its Romanian photovoltaic portfolio to 55 MW by 2017.<sup>43</sup>

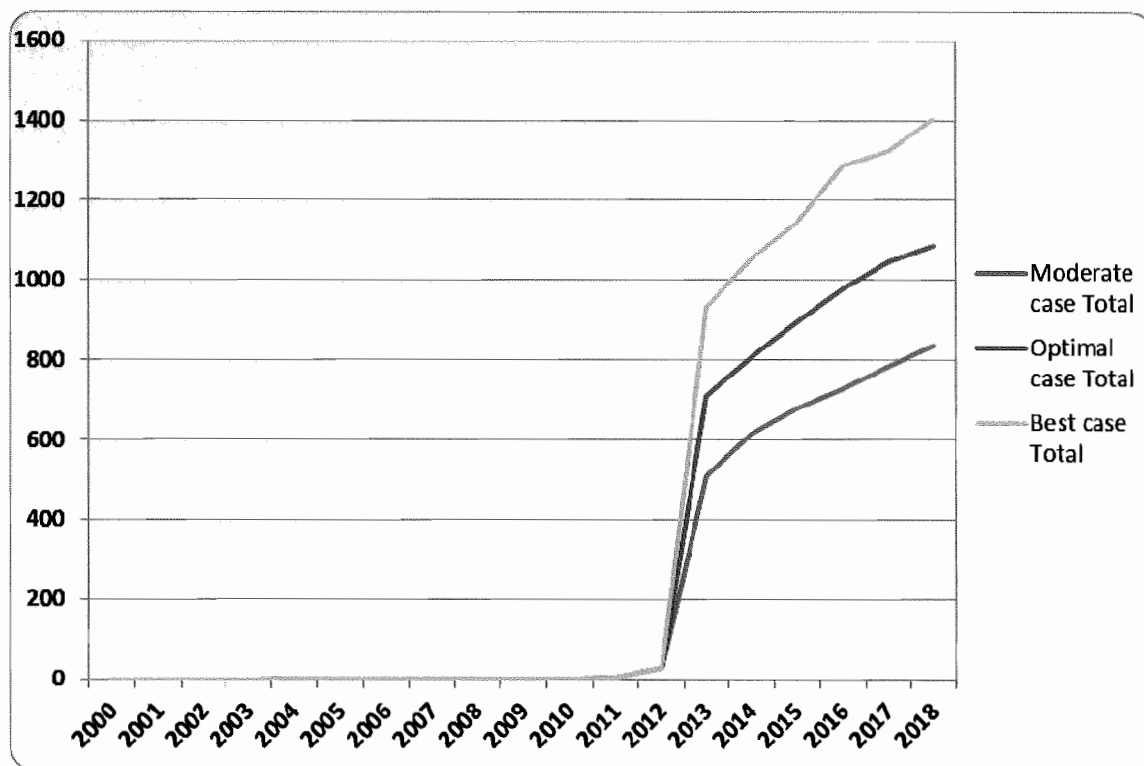


Chart 10: Cumulative development forecast of photovoltaic power plants in Romania in MW from 2000 to 2018; Source: Inea Consulting Ltd.

Blue Sand Investment, a member company of Tiriac Holding, received the EUR 8 million financing from Banca Romaneasca for a solar park that it recently completed in Prahova County. The company has invested EUR 13.6 million in the photo-voltaic park that has a capacity of 8 MW.<sup>44</sup> China-based manufacturer Lightway Solar has recently received approval from China's Development and Reform Commission (NDRC) to develop 50 MW of photovoltaic plants in Prundu, Romania. According to the statement released by the NDRC, total investment in the project will amount to RMB 610 million (around €76 million).<sup>45</sup>

A EUR 100 million investment in a photovoltaic park, near Sebis (Arad), by Spanish company Promocion Inversolar of total 65 MW, is close to completion, according to Mediafax. The Spanish firm has allocated a EUR 100 million budget for the three energy projects carried

<sup>43</sup> <http://www.pv-magazine.com/news/details/beltrag/enel-to-add-55-mw-of-pv-capacity-in-romania-and-21-mw-in-italy-100011029/#ixzz2ToJmNBUp>

<sup>44</sup> <http://business-review.eu/featured/banca-romanesca-grants-eur-8-mln-financing-to-tiriac-holding-member-for-solar-park/>

<sup>45</sup> <http://www.pv-magazine.com/news/details/beltrag/lightway-solar-receives-chinese-government-approval-to-build-50-mw-pv-project-in-romania-100011188/#ixzz2ToKPhwLa>

out in Sebis on a total area of almost 200 hectares. CFO Jose Maria Abul said the first two projects cover a total area of 44 hectares, and that 72,000 solar panels with a total power of 15 MW had already been installed. The rest 50 MW should be installed by the end of 2013.<sup>46</sup> Astronergy Solar Netherlands, part of China's Chint group, entered the Romanian renewable sectors after acquiring a solar park at the end of October 2013.<sup>47</sup> The company took over a solar farm with an installed capacity of 5.98 MW developed by ACV Solar Technology in Cluj County.

#### 6.1.4 TURKEY

##### 6.1.4.1 Overview of photovoltaic market development in Turkey

Turkey is emerging market for photovoltaic energy investments amongst SEE countries. By the end of 2013, the country had approximately 89 MW cumulative installed capacity, and with an expected cumulative installed capacity of to reach 204 MW by the end of 2014. The maturing photovoltaic markets in Germany, Spain, France, and feed-in tariff cuts in Czech Republic, Italy and Bulgaria allowed investors to look for new opportunities in South East European (SEE) nations.

By the end of 2012 Turkey mostly used solar energy for heating purposes through solar thermal collectors. The use of solar PV systems in Turkey was limited. Some governmental organizations use PV in remote services areas such as telecom stations, solar lighting solutions, forest fire observation towers and highway emergency.

However the country's carbon emissions increased by almost 140% between 1996 and 2007. There is international pressure to ensure that those emissions are capped. Turkey signed the Kyoto Protocol in 2009, though few initiatives have been launched by the Turkish government in that area.

The photovoltaic development in Turkey was started with small scale photovoltaic installations below 20 KW in 1999. In opposite to the rapid expansion of solar thermal market, the photovoltaic power capacity remained relatively unchanged and reached only 428 KW at the end of 2005. The total installed photovoltaic power capacity at the end of

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<sup>46</sup> <http://www.thediplomat.ro/articol.php?id=4028>

<sup>47</sup> <http://www.business-review.eu/featured/astronergy-snaps-up-6mw-solar-farm-in-romania/>

2012 reached 11 MW and 89 MW at the end of 2013, which represents insignificant share of the overall electricity generation capacity of Turkey. This capacity represents mostly small scale roof-top and ground based installations, back-up energy solutions, and many of them are off-grid. There is no existing large scale project in MW range at the moment.

The introduction of photovoltaic generation support mechanisms in 2005 and the subsequent amendments in 2007, 2010, 2012 and 2013 finally helped the Turkish photovoltaic energy market to build ground for solid growth, which is expected between 2014 and 2018. In 2005 the country's first Feed-in Tariff for renewable energy was introduced at a little over 5 USD cents per kWh for a period of ten years, and a favorable licensing regime was established for renewable energy projects. The amendments in Renewable Energy Law at the end of 2013 law finally positively answered to all calls and investor's interest.

The Turkish feed-in tariff for photovoltaic was increased in 2010 and now stands at USD cents 13.3 per kWh. The government offers additional incentives for local procurement if there is a domestic component in the manufacture of the photovoltaic turbine. Local involvement can increase the tariff with additional 6.7 USD cents per kWh, which will result in total USD cents 20 per kWh. Local procurement incentives apply for the first five years of operation of the photovoltaic power plants. In relation with local procurement incentives first factories for production of photovoltaic modules of Anel Enerji and Atsco Solar have been established, with new factories expected to follow them on the market in next 2 years. Photovoltaic developers can sell into a national power pool or they can contract privately with customers where prices are generally higher than the guaranteed price. Turkey's national transmission company is required to provide grid connections to all renewable power projects.

Even taking into account the slow nature of governmental support, Turkey is one of Europe's most promising emerging solar markets, and cannot be easily neglected. There are, as in most cases, some obstacles to be overcome in Turkey. Short term problems include the current absence of clear vision for solar sector development, missing or unclear parts in legislation related to grid-connection, an information gap amongst people, and lack of experience and skilled workforce.

The Turkish Electricity Production Company (TEİAŞ) announced on 10<sup>th</sup> of June 2012 that it plans to fix major loopholes in regulations in order to further promote the generation of solar energy in the country. In a written statement TEİAŞ indicated that investors who apply for a license to operate solar power generation fields in a location desired by many will have to submit their project proposals to the Energy Market Regulatory Agency (EMRA) after competing their feasibility studies and necessary documents for licensing. A commission established by TEİAŞ will then select the best offer. The commission, made up of five members, will consider the application that bids the highest amount for the tender<sup>48</sup>.

By doubling the size of projects for which FITs are available, the Turkish government has finally fired the starting gun on solar at the beginning of October 2013. 'We have been waiting five years for this.' says Enerparc's Ertug Babatas. The Turkish government's decision to double the FIT payment eligibility of small scale PV installations up to 1 MW, and to remove any size limits for self-consumption projects, will fire solar demand that has been pent up for five years, said one industry representative.<sup>49</sup>

Ertug Babatas, told also pv magazine: "I feel that this is the moment we've been waiting five years for." The government will pay a FIT for small scale solar installations – known as unlicensed schemes – of US\$0.133/kWh under ten-year PPAs with Babatas explaining the shorter term of the FIT deals, usually 20-25 years, was down to the conservative nature of the Turkish government. "It's difficult to work out how much the energy price will be in ten years and we could see that already in ten years this FIT is a good price," added Babatas.<sup>50</sup>

The first licensing round for PV projects larger than 1 MW in Turkey has been exceeded by almost 15 times. So far, 496 applications with close to 8.9 GW have been submitted to the Turkish Energy Regulatory Authority (EPDK), according to information provided to pv magazine by Enerparc, which itself is in the bidding for 10 projects it plans to develop with Turkish partners. The cap for the first licensing round was 600 MW. While Turkey has attracted a great deal of attention from the international PV industry, most of the investors that submitted applications are Turkish, according Ertug Babatas, business developer at Germany's Enerparc AG. A few foreign investors with offices in Turkey have also submitted applications but they are estimated to be less than 5% of the total applicants.<sup>51</sup>

<sup>48</sup> <http://www.todayszaman.com/news-283044-teias-fixes-regulations-to-promote-solar-power-production.html>

<sup>49</sup> [http://www.pv-magazine.com/news/details/beitrag/turkey-small-scale-solar-rules-released\\_100013031/#ixzz2jweZmHSx](http://www.pv-magazine.com/news/details/beitrag/turkey-small-scale-solar-rules-released_100013031/#ixzz2jweZmHSx)

<sup>50</sup> [http://www.pv-magazine.com/news/details/beitrag/turkey-small-scale-solar-rules-released\\_100013031/#ixzz2jweZmHSx](http://www.pv-magazine.com/news/details/beitrag/turkey-small-scale-solar-rules-released_100013031/#ixzz2jweZmHSx)

<sup>51</sup> [http://www.pv-magazine.com/news/details/beitrag/almost-9-gw-of-projects-submitted-for-licensing-in-turkey\\_100011739/#ixzz2jwgrpCG](http://www.pv-magazine.com/news/details/beitrag/almost-9-gw-of-projects-submitted-for-licensing-in-turkey_100011739/#ixzz2jwgrpCG)



Meanwhile, the Turkish Electricity Transmission Company (TEIAS) is expected to soon publish the list of grid connection points and capacity of all the projects on its website and announce the date, place and time for the tender. The tender will begin a minimum of 30 days after TEIAS publishes the list, Babatas told pv magazine, citing a draft of Turkey's tender regulations. EPDK defines larger projects as larger than 1 MW. It remains unclear whether the regulator will grant licenses to the lowest-cost bidder in a reverse auction or whether it will involve a fixed FIT agreement with the off taking utility.<sup>52</sup>

It will important to see how the Turkish regulator and all government authorities involved in permitting and licensing process for photovoltaic power plants will manage with the flood of applications and how quickly they are processed. A further obstacle for the photovoltaic market in Turkey will be the complicated issues about land rights, the low cultural understanding of long-term contracts, and relatively the difficult financing at this moment.

The photovoltaic sector in Turkey is not developed as we mentioned. However a number of Turkish companies have already entered in joint ventures with international groups. Three of Germany's solar energy firms, Phoenix Solar, Gehrlicher Solar and Soventix made their entry into the Turkish solar energy market within the last few months through partnerships with Turkish companies.

Photovoltaic (PV) systems integrator Phoenix Solar teamed up with Turkish renewable energy company Ires Enerji last January to offer solar energy solutions in the under 500 kilowatt (KW), license-free market segment. Gehrlicher Solar, on the other hand, partnered with Turkish Merk Enerji<sup>53</sup> to build solar power plants in Turkey's southern and south-eastern regions and also plans to develop solar power projects for the lucrative small-scale PV market. We may expect that Gehrlicher Solar will try to repeat in Turkey already implemented business model for large-scale photovoltaic plants without FIT usage.<sup>54</sup> Recently the company started such a 250 MWp project in Spain.

The company from Germany's solar industry to enter Turkey is the Duisburg-based Soventix, which is already active in Turkey through local PV companies and plans to develop solar power plants for the small scale PV market. The company's CEO, Thorsten Preugschas, met with Turkey's Minister of Economy, Zafer Caglayan during his visit to Germany in early

<sup>52</sup> [http://www.pv-magazine.com/news/details/beitrag/almost-9-gw-of-projects-submitted-for-licensing-in-turkey\\_100011739/#ixzz2jwggk1Wl](http://www.pv-magazine.com/news/details/beitrag/almost-9-gw-of-projects-submitted-for-licensing-in-turkey_100011739/#ixzz2jwggk1Wl)

<sup>53</sup> <http://www.invest.gov.tr/en-US/Infocenter/news/Pages/290212-german-solar-companies-in-turkish-solar-market.aspx>

<sup>54</sup> [http://www.pv-tech.org/news/gehrlicher\\_solar\\_signs\\_agreement\\_for\\_250mw\\_spanish\\_pv\\_plant](http://www.pv-tech.org/news/gehrlicher_solar_signs_agreement_for_250mw_spanish_pv_plant)

February 2012. With guaranteed support from the Turkish government for renewable energy projects, Soventix will embark on large-scale solar projects in Turkey in the long term. "Turkey has tremendous potential in solar energy. We expect fast growth in Turkey due to our international PV know-how and strong local partnerships," said Preugschas, according to a press release by Soventix<sup>55</sup>.

Turkish solar developer Entropy Energy is currently finishing feasibility studies for potential solar power plant areas especially in the South-East region of Turkey. This region is well-known to host large sum of areas with low slope values and solar irradiation figures are well above the average. One of their pilot projects has been introduced to the DESERTEC concept and has been shortlisted by the committee. The proposed Edessa will have installed capacity of 12 MW.

EUAS, which is State Turkish Electricity Generation Company One of the goals which is specified in 2010-2014 Strategy Plan of Company, is determined as to lead the expansion of the solar power plants in appropriate regions of Turkey by establishing a solar power plant which has 10-15 MW installed power for environmentally conscious electricity generation.

With the aim of having the feasibility study done, a loan agreement for the grant of €250,000 was signed between EAUS and KfW at the of 2012 related to the solar energy power plant to be established in the area of Birecik Hydro Power Plant in free open space of 377,000 sq.m. Feasibility study has been supposed to finish by the end of 2011 or early 2012<sup>56</sup>.

#### 6.1.4.2 Grid Interconnection

Pursuant to the Turkish Renewable Energy Law the Connection of Producers and Consumers of Electric Power to the Transmission and the Distribution Networks the Turkish Electricity Transmission Co. (TEİAŞ) and the local private electricity distribution companies (DSO's/DisCos).

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<sup>55</sup> <http://english.sabah.com.tr/Economy/2012/02/29/turkeys-sun-peaks-german-interest>

<sup>56</sup> <http://www.euas.gov.tr/Sayfalar/Eng/AnaSayfa.aspx>

#### 6.1.4.3 Power Off-Take

Pursuant to Article 6 of the Renewable Energy Law, the Market Financial Reconciliation Centre ("MFRC", known as well as "PMUM") shall announce the RES Total Amount (1) and the Payment Obligation Ratio (2) of each supplier for each invoice period. The MFRC shall invoice each supplier providing electricity to consumers the amount they are obligated to pay and the collected amount shall be payable to the generation licensees being subject to RES Support Mechanism in proportion to their shares<sup>57</sup>.

The term of the PPA shall be 10 years from putting the photovoltaic power plant into operation (such putting into operation to happen not later than 31 December 2015) for all new photovoltaic power plants.

#### 6.1.4.4 Feed-in tariff (FIT)

The Renewable Energy Sources ("RES") Support Mechanism shall be provided for those facilities which (i) hold a RES Certificate, (ii) have commenced/ will commence their operations within the period 18 May 2005 to 31 December 2015, and (iii) apply to EMRA by October 31st of the previous year. EMRA announces those who will be subject to the RES Support Mechanism by November 30<sup>th</sup> each year. With respect to facilities commencing operations after 31 December 2015, the Council of Ministers shall determine the amount, pricing, terms and resources applicable to such facilities in accordance with various developments including in particular supply security and provided that the pricing shall not exceed those set out are explained below.

It is also noteworthy that pursuant to Article 6 of the Renewable Energy Law, generation licensees who are involved in the RES Support Mechanism are prohibited from acting outside this mechanism in the relevant year. Nonetheless, those generation licensees based on renewable energy resources who are not subject to the RES Support Mechanism are allowed to freely trade electricity in the electricity market within the scope of their licenses<sup>58</sup>.

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<sup>57</sup> SEE Legal Guide 2012, <http://www.seelegal.org/code/navigate.php?id=7>

<sup>58</sup> SEE Legal Guide 2012, <http://www.seelegal.org/code/navigate.php?id=7>

Pursuant to Article 6 of the Renewable Energy Law, generation licensees subject to the RES Support Mechanism are entitled to benefit from the prices set out in Chart No. I of the Renewable Energy Law<sup>59</sup>. A generation licensee can only benefit from the pricing restrictions under Chart No. I for a maximum term of 10 years as from its operation date.

In the initial version of the Renewable Energy Law enacted in 2005, it is stated that average wholesale electricity price of the previous year, which is determined by EMRA, will be paid for renewable electricity generation. With the amendment in 2007, the average wholesale price was lower bounded to 5 Euro cent/kWh and upper limited to 5.5 Euro cent/kWh.

The Regulator EMRA, by virtue of enactment of amendment of Renewable Energy Law of 29 December 2010, has approved new preferential tariffs for electricity generated from renewable energy sources. Current prices for renewable power plants are as follows:

<b>PHOTOVOLTAIC RENEWABLE ENERGY SOURCES</b>	<b>PRICES in USD cent/kWh</b>
Photovoltaic power plants	<b>7.3</b>
Hydro power plants	<b>7.3</b>
Geothermal power plants	<b>10.5</b>
Solar power plants (PV and CSP)	<b>13.3</b>
Biomass power plants (including landfill gas)	<b>13.3</b>

**Table 2: Feed-in-tariffs for electricity from renewable sources in Turkey<sup>60</sup>**

One of the major critics to this tariff scheme was the payment of an identical electricity price for all types of renewable energy generation, as power generation costs significantly differ for each renewable energy resource. For example, solar power generation can not to be achieved with a relatively low price of 5.5 Euro cents, considering the high costs of solar technology.

<sup>59</sup>SEE Legal Guide 2012, <http://www.seelegal.org/code/navigate.php?id=7>

<sup>60</sup> <http://www.epdk.org.tr/>

The amendment in December 2010 has replaced this flat electricity price of between 5 Euro cents/kWh and 5.5 Euro cents/kWh with a range of guaranteed prices to promote various types of renewable energy, as shown in Table 5. An unexpected change was that the currency quoted in tariff scheme has changed from Euro cents to USD cents.

#### 6.1.4.5 Financial Incentives and Support for RES electricity

In addition to the preferential feed-in tariffs Turkey provides certain additional incentives for investors in the renewable energy sector. Should the mechanical and electromechanical components of a power plant, which is subject to the RES Support Mechanism and commenced operations before 31 December 2015, be manufactured in Turkey, the unit prices shall be increased in the amounts set out of the Renewable Energy Law for a period of five years starting from the operational date of the power plant<sup>61</sup>.

<b>ADDITIONAL INCENTIVES FOR DOMESTIC PROCUREMENT</b>	<b>PREMIUM in USD cent/kWh</b>
Production of PV panel integration and solar structural mechanics	<b>0.8</b>
PV modules	<b>1.3</b>
PV cells	<b>3.5</b>
Inverters	<b>0.6</b>
Material on the PV module that focuses solar ray	<b>0.5</b>
<b>TOTAL</b>	<b>6.7</b>

**Table 3: Additional incentives to Feed-in-tariffs for electricity from solar PV sources in Turkey for domestic procurement**

During the first 10 years of operation of renewable energy plants, an 85% discount is applied on several land use fees. This includes the fees related to permission, rent, right of access, and usage when the property is under the possession the General Directorate of Forestry or the Under Secretariat of Treasury. The 85% discount is also applied to fees

<sup>61</sup> <http://www.pekin-pekin.com/publications.html>

related on investments in the transportation infrastructure and power lines until the connection point to the grid. On the next table you will see additional incentives for domestic procurement (using of materials and components), which are available for the first 5 years of operation of photovoltaic power plants in Turkey.

### 6.1.5 UKRAINE

The use of solar PV systems in Ukraine has been limited by the end of 2009. Till then some governmental organizations used PV in remote services areas such as telecom stations, solar lighting solutions, forest fire observation towers and highway emergency. However market situation is changing rapidly after the middle of 2010 as consequence of green feed-in tariff law, which was introduced in 2009. From the map above is visible that large parts of Ukraine are exposed to sunlight most of the year, making solar energy a viable choice for photovoltaic power generation.

Ukraine saw a 51.4% solar capacity hike in the first half-year of 2013, with 12 of the 23 solar power plants now in the country built during the period.<sup>62</sup> Solar capacity in Ukraine reached 747 MW at the end of 2013.<sup>63</sup> Another 700 MW solar power plants have been planned for 2014 but due to political turmoil in Ukraine their realizations is under question now. Even more impressive gains were evident over the last two years: Ukrainian solar parks' generated 333.6 million kWh of energy last year, marking a whopping 11-fold increase year-over-year, according to the country's National Commission for Energy Regulation (NERC). Ukraine is undisputed leader amongst other CIS countries about photovoltaic power sector development.

"If Ukraine keeps up the pace, renewable energy sources may become the driving force of the Ukrainian economy," said in 2013 Viktor Janovskij, vice president of Ukraine's Trade and Industry Chamber, at a recent meeting with representatives of the country's Alternative Fuel and Energy Producer Association (AFEPA), adding that the the active investment in the RES sector would allow the creation of competitive production. "Indeed, this is not an exaggeration," AFEPA President Vitalij Davij told pv magazine. "Ukraine possesses a huge

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<sup>62</sup> [http://www.pv-magazine.com/news/details/beitrag/ukrainian-solar-on-the-rise-despite-wary-investors\\_100012355/#ixzz2jyn1QNwU](http://www.pv-magazine.com/news/details/beitrag/ukrainian-solar-on-the-rise-despite-wary-investors_100012355/#ixzz2jyn1QNwU)

<sup>63</sup> [http://www.pv-magazine.com/news/details/beitrag/ukraine-turmoil-leaves-outlook-cloudy\\_100014717/#axzz30xa1xGP1](http://www.pv-magazine.com/news/details/beitrag/ukraine-turmoil-leaves-outlook-cloudy_100014717/#axzz30xa1xGP1)

potential in mechanical engineering. We'd unleash it if we started producing in our own facilities for the sector, especially solar PV material and devices and wind power turbines."<sup>64</sup>

The good news about the rapid solar expansion in Ukraine between 2010 and 2013 came amid the traditional energy sector's troubles, which mostly stem from the exacerbating shortage of current assets, a result of the state's socially oriented tariff policy. Despite the laws giving financial breaks and preferences to the companies, Ukraine appeared to be a high-potential emerging market with an extremely high investment appeal of a "green" tariff for solar energy that makes investors risk and find their solutions to cope with all mentioned above complications. While this segment of alternative energy is at the initial stage of development in Ukraine, the country envisages a favorable situation for solar energy sector expansion.

Over the past 3 years more than 20 solar power plants were put into operation in Ukraine. New installations with total capacity of 1.8 GW have been planned to be launched by 2016 according to analysis by Macquarie Research's, mentioned by State Agency for Energy Efficiency and Energy Conservation (SAEEEC)<sup>65</sup>. In addition, Ukraine's parliament in July 2013 at first reading approved a bill aimed at simplifying the access of households to the mechanism of a feed-in tariff. The adoption of this document might give an additional boost to the development of solar energy in Ukraine, as it will make the installation of PV panels on the roofs of citizens' own homes economically attractive<sup>66</sup>.

Ukraine offers the highest feed-in tariff rate of any European country. The munificent FiT rate forms part of the former President Yanukovich's wider renewable energy ambitions. Yanukovich hoped to dramatically cut the nation's dependence on natural gas, the subject of a long-running dispute with Russia which escalated to such a point where Russia cut off all gas supplies to Ukraine in 2006<sup>67</sup>. Yanukovich believed the nation's push towards self-sustaining energy production will help the country "earn and save money for decades to come." As a result, the president set an ambitious target of 1,000 MW of installed solar capacity by 2015.

What distinguishes the Ukrainian photovoltaic market from others is that current growth is driven by a single motor engine. The role of this engine is played by Austria-based Activ

<sup>64</sup> [http://www.pv-magazine.com/news/details/beitrag/ukrainian-solar-on-the-rise-despite-wary-investors\\_100012355/#ixzz2iyv1QNWU](http://www.pv-magazine.com/news/details/beitrag/ukrainian-solar-on-the-rise-despite-wary-investors_100012355/#ixzz2iyv1QNWU)

<sup>65</sup> <http://saee.gov.ua/en/archives/4378>

<sup>66</sup> <http://www.kyivpost.com/content/business/ukraine-to-triple-solar-power-capacity-in-2012-310807.html>

<sup>67</sup> [http://www.pv-tech.org/news/pv\\_capacity\\_in\\_ukraine\\_could\\_reach\\_500mw\\_by\\_the\\_end\\_of\\_2012](http://www.pv-tech.org/news/pv_capacity_in_ukraine_could_reach_500mw_by_the_end_of_2012)

Solar, which recently broke its own 300 MW record milestone. Overall, more than 75% of all cumulative photovoltaic capacity in Ukraine has been installed by Activ Solar. A lot of solar energy experts consider the company a phenomenon. Indeed, in less than 18 months, its work meant the Ukraine became home to some of the largest photovoltaic power plants in the world, including Ohotnikovo at 105.56 MW and Perovo at 82.65 MW.

Ukraine is one of the most energy inefficient countries in the region and restructuring and upgrading its energy sector continues to be one of the key development challenges for the Government. The sector faces problems maintaining security, reliability and quality of supply due to delays in energy sector reform, poor financial condition of energy sector enterprises, lack of investments, and deferred maintenance in aging infrastructure.<sup>68</sup> An Energy Community Ministerial Council meeting in 18<sup>th</sup> October 2012 in Budva, Montenegro, has agreed on the implementation of a key EU Directive on the promotion of renewable energy (RES Directive) by the Energy Community.<sup>69</sup>

Eastern Partnership countries Moldova and Ukraine, as well as Western Balkan countries party to the Energy Community, have thereby committed to a binding share of renewable energy as part of their overall consumption in 2020. The shares for the nine contracting parties to the Energy Community were calculated based on the EU's methodology and reflect an equal level of ambition as the targets fixed for EU Member States.

The final decision also contains a review clause that will allow emerging evidence to be taken into account. The targets for the share of renewable energy in contracting parties in 2020 are as follows: Moldova 17%, **Ukraine 11%**, Albania 38%, Bosnia and Herzegovina 40%, Croatia 20%, Former Yugoslav Republic of Macedonia 28%, Montenegro 33%, Serbia 27% and Kosovo 25%.

The RES Directive establishes different mechanisms for cooperation on renewable energy within the EU and between EU Member States and third countries. With this decision from 18<sup>th</sup> October 2012 and the acceptance of binding targets contracting parties will be able to participate in all cooperation mechanisms, meaning in particular that statistical transfers of renewable energy for the purposes of target achievement will be possible independently from physical flow of electricity. In addition, the decision lays down a number of adaptations to the rules for statistical transfers and joint support schemes between the contracting

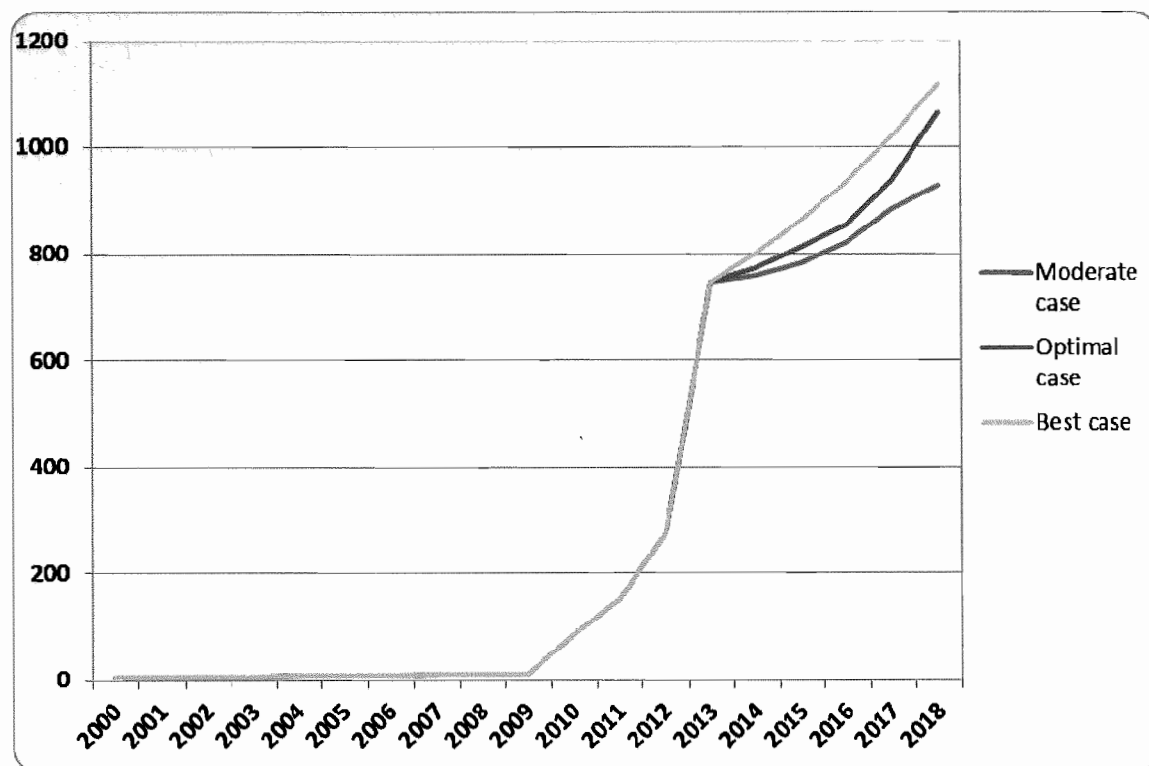
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<sup>68</sup> <http://www.worldbank.org/en/country/ukraine/overview>

<sup>69</sup> [http://www.enpi-info.eu/maineast.php?id=30684&id\\_type=1&lang\\_id=450](http://www.enpi-info.eu/maineast.php?id=30684&id_type=1&lang_id=450)



parties and EU Member States to ensure the original objectives of the RES Directive are preserved.



**Chart 11: Cumulative development forecast of photovoltaic power plants in Ukraine in MW from 2000 to 2018; Source: Inea Consulting Ltd.**

The political turmoil began suddenly in Ukraine in February 2014 and resulted in the ceasing of power of President Viktor Yanukovich and the annexation of the southern region of Crimea by Russia. Approximately half of Ukrainian installed photovoltaic capacity is located in Crimea. As the most of photovoltaic power plants in Crimea are financed from Russian banks, increasing of Russian solar capacity probably will be announced soon. According to largest solar power plants developer and investors in Ukraine, Active Solar "The current political instability and the ensuing tensions have caused a severe disruption of economic activity in Ukraine"<sup>70</sup>

Energorynok's announcement on 2 April 2014 said that it has officially stopped purchasing all electricity produced in Crimea. According to the state energy company, an extraordinary meeting of the Wholesale Electricity Market (WEM) of Ukraine voted 9-0 to adopt the draft

<sup>70</sup> [http://www.pv-magazine.com/news/details/beltrag/crisis-in-ukraine-threatens-domestic-pv-industry\\_100014746/#ixzz33B2Ec73l](http://www.pv-magazine.com/news/details/beltrag/crisis-in-ukraine-threatens-domestic-pv-industry_100014746/#ixzz33B2Ec73l)

resolution “On protection of rights and freedoms in the temporarily occupied territory of Ukraine” due to what it called “confirmed *force majeure*”. WEM is a union of electricity producers, power retail, and wholesale suppliers across the country while Energorynok is a state enterprise that functions as a single buyer and wholesale supplier of electricity.<sup>71</sup>

Ukraine had been the 13<sup>th</sup> largest photovoltaic market in the world in 2013, but in 2014 it will lose its position and will fall according to expectation of Inea Consulting Ltd. below 25<sup>th</sup> position. Overall situation regarding photovoltaic market in Ukraine remains vulnerable and unpredictable. Besides political instability the country is facing severe financial crisis in the moment and probably new Ukrainian government will reconsider and has high probability to put on hold its plans for renewable energy sectors

## 6.2 GROWTH PERSPECTIVES FOR TURKISH PHOTOVOLTAIC MARKET BY 2018

The energy demand of Turkey was doubled between the years 2000–2010 and is expected to fourfold between the years 2000–2025<sup>72 73</sup>. This rapid increase in demand is due to the high economic development rate of Turkey. The biggest growth area in recent years has been natural gas imported from Russia and Iran. In 1995, 20% of Turkey’s electricity needs were generated from natural gas. Today, that has increased to 44%. It is a dependence that the Turkish government would like to diminish<sup>74</sup>. There are plans for investment in photovoltaic power, nuclear power and an extra of hydropower.

There is no shortage of demand for electricity. Despite a growth in consumption of 60% between 2000 and 2010, electricity consumption per capita is only about 25% of the European average. At the same time, the economy is growing strongly. Turkey’s GDP increased by 9% during 2010 and reached 8.3% at the end of 2011. The country’s young population is over 77 million and continuing to grow. By 2020 total installed electricity generating capacity will double at an expected cost of € 3.72 billion. Meanwhile, recently published TEIAS data show the country's electricity consumption rose by 78% over the past

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<sup>71</sup> [http://www.pv-magazine.com/news/details/beltrag/crisis-in-ukraine-threatens-domestic-pv-industry\\_100014746/#ixzz33B33pUUA](http://www.pv-magazine.com/news/details/beltrag/crisis-in-ukraine-threatens-domestic-pv-industry_100014746/#ixzz33B33pUUA)

<sup>72</sup> K. Kaygusuz, “Environmental Impacts of Energy Utilisation and Renewable Energy Policies in Turkey”, Energy Policy, vol. 30 pp. 689–698, 2002.

<sup>73</sup> K. Kaygusuz, “Energy Policy and Climate Change in Turkey”, Energy Conversion and Management, vol. 44, pp. 1671–1688, 2003.

<sup>74</sup> <http://www.leonardo-energy.org/photovoltaic-power-sector-turkey-take>

10 years from 131.9 billion kWh in 2003 to 235 billion kWh last year. In 2014, TEIAS estimates the country will consume 256 billion kWh of electricity.<sup>75</sup>

Turkish Energy Minister Taner Yildiz says this impressive increase is the result of the improvement of welfare in the country and that Turkey "will nearly double its electricity consumption to 450 billion kWh by 2023."<sup>76</sup> The country's installed electricity capacity of 62,000 MW (62 GW) as of the end of 2013 is expected to reach 120,000 MW (120 GW) in 2023.<sup>77</sup> Turkish government aims to have at least 3,000 MW (3 GW) of solar installations by 2023. Economical potential of Turkey for solar PV is evaluated by EPIA in paradigm shift scenario up to 5,700 MW by 2020<sup>78</sup>.

Turkey was ranked as the world's third most attractive emerging photovoltaic (PV) market, followed by Romania according world consulting firm IHS emerging PV markets attractiveness survey in Q4 2013.<sup>79</sup> Rising energy prices have pushed photovoltaics to reach grid parity more quickly than expected.

Ates Ugurel, Managing Partner at iRES Enerji, explained that the 600 MW government tender, which was held in 2013 will be fulfilled within the next 2 years, after which a tender for 2.5GW is expected to be announced. This may bring installed solar power capacity in Turkey to 3.1 GW by 2016.

Bosch Solar Energy AG has announced it will open a new sales office in Turkey. The company said it will focus on planning and installing turnkey photovoltaic parks in the country<sup>80</sup>. GiraSolar, a U.S.-Dutch solar company, has begun talks with a local energy firm to build Turkey's first and Europe's biggest photovoltaic power plant while also manufacturing solar panels for export to Europe. Projected capacity of the discussed project is 100 MW<sup>81 82</sup>.

<sup>75</sup> <http://www.pv-magazine.com/news/details/beitrag/turkey-secures-350-million-renewable-energy-loan-100015202/#ixzz33BfKAdok>

<sup>76</sup> <http://www.pv-magazine.com/news/details/beitrag/turkey-secures-350-million-renewable-energy-loan-100015202/#ixzz33BfCHhk>

<sup>77</sup> <http://www.invest.gov.tr/en-US/Infocenter/news/Pages/110414-german-energy-companies-join-forces-for-turkey-wind-projects.aspx>

<sup>78</sup> <http://www.epia.org/publications/epiapublications.html>

<sup>79</sup> <http://www.pv-magazine.com/opinion-analysis/publishers-comment/blogdetails/beitrag/south-africa-worlds-most-attractive-emerging-country-for-solar-100014074/#axzz33rzug9QW>

<sup>80</sup> <http://www.pv-magazine.com/news/details/beitrag/bosch-solar-to-enter-turkish-market-100007332/#ixzz20Du9bJqU>

<sup>81</sup> <http://www.hurriyetdailynews.com/default.aspx?pageid=438&n=us-dutch-firm-to-build-europe8217s-biggest-solar-plant-in-turkey-2011-03-28>

<sup>82</sup> <http://www.leonardo-energy.org/wind-power-sector-turkey-take>

A Turkish subsidiary of China's Yingli Solar, Yingli Solar Turkey, signed a contract with Turkish solar firm Tekno Ray Solar for the realization of 30 MW of solar PV projects in the country. The deal, which was signed at the ICCI 2014 Expo<sup>83</sup> in Istanbul in late April, represents a significant foray into the Turkish PV market for Yingli, and helps bolster Tekno Ray Solar's position as the leading solar company in Turkey and expects to install 35 MW PV capacity by the end of 2014.<sup>84</sup>

The Turkish government awarded the first two licenses for an 8 MW solar park in the region of Elazığ and a 5 MW project in the eastern region of Erzurum in mid-May 2014.<sup>85</sup> They were part of the first round of the country's licensing program for large-scale solar projects<sup>86</sup> last year, which attracted nearly 15 times the 600 MW cap set by the Turkish Energy Regulatory Authority (EPDK). The EPDK has announced that the agency will begin accepting applications for new solar PV licenses in April 2015.<sup>87</sup>

At the end of May 2014, The World Bank has approved \$300 million in financing from the International Bank for Reconstruction and Development (IBRD) and \$50 million from the Clean Technology Fund (CTF) for renewable energy projects in Turkey, which results in total \$350 renewable energy financing.<sup>88</sup>

Great news at the end of 2013 have been latest amendments in Turkish renewable energy law from **1<sup>st</sup> October 2013** stipulated that there is exemption from licensing and company establishment obligations for the renewable power generations facilities, including photovoltaic power plants, which have **below 1 MW capacity**. This considered as many of industry experts as kick-off start for fast development of Turkish photovoltaic sector.

Photovoltaic power capacity will exhibit sizeable increase by the end of 2018 and even to 2020 reveals forecast of Inea Consulting Ltd. assuming the planned and expected projects. After that between 2020 and 2025 it will slow down its speed. New supportive legislation, and increase in the feed-in tariff at the end of 2010, latest amendments from 2012 and

<sup>83</sup> [http://www.pv-magazine.com/news/details/beitrag/turkish-solar-market-gathering-pace\\_100014917/#axzz30XUQVsz0](http://www.pv-magazine.com/news/details/beitrag/turkish-solar-market-gathering-pace_100014917/#axzz30XUQVsz0)

<sup>84</sup> [http://www.pv-magazine.com/news/details/beitrag/yingli-solar-signs-contract-for-30-mw-pv-projects-in-turkey\\_100014961/#ixzz33BDwjoH](http://www.pv-magazine.com/news/details/beitrag/yingli-solar-signs-contract-for-30-mw-pv-projects-in-turkey_100014961/#ixzz33BDwjoH)

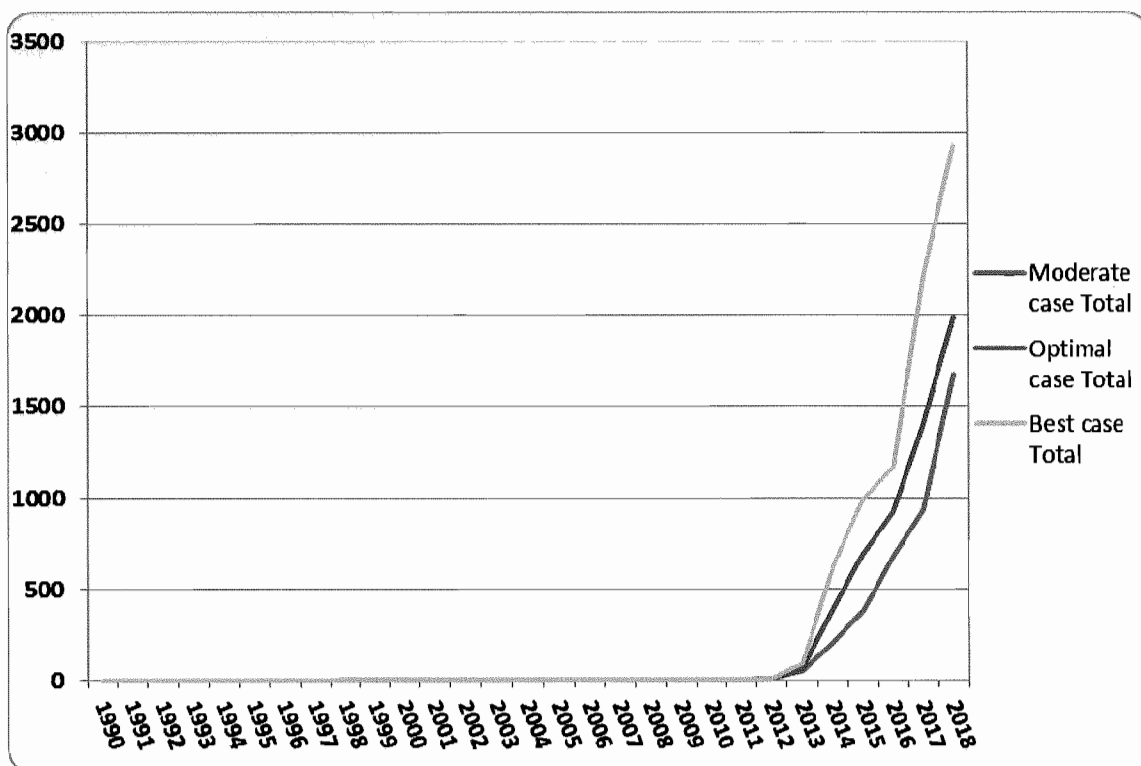
<sup>85</sup> [http://www.pv-magazine.com/news/details/beitrag/turkey-awards-first-large-scale-solar-project-licenses\\_100015074/#axzz32ooC451o](http://www.pv-magazine.com/news/details/beitrag/turkey-awards-first-large-scale-solar-project-licenses_100015074/#axzz32ooC451o)

<sup>86</sup> [http://www.pv-magazine.com/news/details/beitrag/turkey-over-3-gw-of-projects-submitted-for-licensing\\_100011727/#ixzz31aZfnYXN](http://www.pv-magazine.com/news/details/beitrag/turkey-over-3-gw-of-projects-submitted-for-licensing_100011727/#ixzz31aZfnYXN)

<sup>87</sup> <http://www.pv-magazine.com/opinion-analysis/publishers-comment/blogdetails/beitrag/turkey-sets-date-for-new-solar-pv-applications-100013414/#axzz32orOp6aL>

<sup>88</sup> <http://www.pv-magazine.com/news/details/beitrag/turkey-secures-350-million-renewable-energy-loan-100015202/#axzz33BBmS1TY>

2013, and a government target to 3,000 MW of solar power plants connected to the grid by 2023, are encouraging further growth. Electricity generation of up to 1,000 KW (1 MW) from renewable sources is exempt from licensing under Turkey's Energy Market Regulatory Authority (EMRA) regulations. There are discussions this generation of electricity without license to be increased from 1 MW to 2 MW or 2.5 MW



**Chart 12: Cumulative development forecast of photovoltaic power plants in Turkey in MW from 2000 to 2018; Source: Inea Consulting Ltd.**

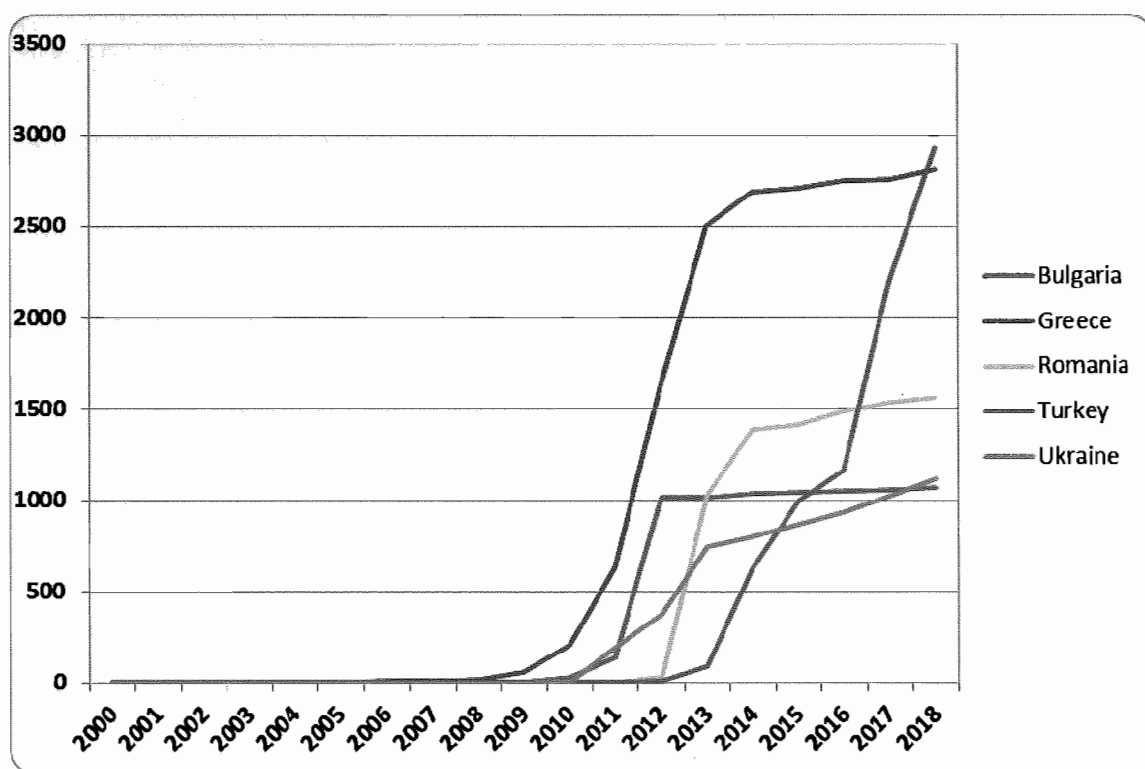
In the first half of 2014 first large scale ground based and industrial rooftop photovoltaic power plants are expected to start operation. We truly hope that the Turkish government will continue support the development of photovoltaic power sector in the country. Additional boost to the market in 2014 and the next years will give grid parity in some southern areas of the country. PV power can already be competitive with the power price that consumers pay for conventional power supply (for example, about 15–18 USD cent/kWh for commercial consumers). Commercial power consumers suffer under high electricity tariffs in Turkey and, as a result, have a particularly strong interest in PV power supply because it provides them electricity at cheaper and constant prices in long terms.

### **6.3 COMPARATIVE OVERVIEW OF GROWTH PERSPECTIVE BY 2018 OF PHOTOVOLTAIC MARKETS IN SELECTED SEE COUNTRIES**

From all above presented information is clearly visible that photovoltaic power markets are mostly policy driven. Establishing of good regulatory framework and feed-in tariff structures combined with other government support mechanism usually lead to large increase in investor's interest and inflow of investments. In addition to support mechanisms, photovoltaic energy markets depend on resources, site approval, grid issues and the competitive environment. For the wind industry, these issues have been critical in defining both the market opportunity and its rules for participation. Economically viable tariffs and efficient and flexible permitting, combined with available grid capacity, are the key elements necessary for one country to build stable photovoltaic energy market. When adequate government support for the respective country is established then photovoltaic market usually grows with sharp rates for the first between 2 and 5 years. After that markets calm down and grow with slower rates. On the opposite side, missing of adequate regulatory framework and feed-in tariff structures leads to absence of investors in solar projects.

The economic uncertainty and exceeding of solar quota planned in NREAP's by 2020 in several CEE & SEE photovoltaic markets like Czech Republic, Bulgaria, Romania and Greece has pushed government policymakers to make decisions that have a negative effect on the market, such as imposing retroactive or other unpopular measures. Such decisions severely affect investor confidence even as photovoltaic technology and competitiveness improve – slowing market development in a way that is not easily predictable. Moreover, these measures harm these countries' credibility not just for PV but for their whole financing sector.

In our opinion probability for Turkish PV market to face retroactive subsidy cuts or other similar measures in the next few years is limited. This assumption along with the probability for high growth of Turkish PV market by 2018 are supported by the following 5 main reasons: i) growing energy needs of Turkish economy and industry; ii) quickly growing electricity prices for businesses and households; iii) grid parity with electricity cost for households and businesses in Southern parts of Turkey; iv) growing population of Turkey, which will result in more energy consumption in the next 20 years; v) excellent opportunities existing in non-licensed market segment, which enables photovoltaic installations below 1 MW with simplified permitting procedures.



**Chart 13: Comparative cumulative development forecast of photovoltaic power plants in selected SEE countries in MW from 2000 to 2018; Source: Inea Consulting Ltd.**

Growth perspective for photovoltaic markets in Bulgaria, Greece, Romania, Turkey and Ukraine by 2018 are as follows:

**Bulgaria.** Due to the overheating of Bulgarian photovoltaic market in in 2011 and 2012, exceeding of solar quota according to NREAP growth perspectives for this market by 2018 are very limited. Moderate growth is expected in commercial rooftop installations below 200 KW and residential ones below 30 KW.

**Greece.** High photovoltaic market growth was achieved in Greece between 2009 and 2013 due to generous feed-in tariff scheme and proper government support. Retroactive subsidy cuts and taxes over photovoltaic power plants combined with reduction of feed-in tariffs will result in moderate market growth by 2018 driven mostly by rooftop commercial and residential photovoltaic power plants.

**Romania** was one of the best performing solar markets in the world for 2013 when added slightly above 1 GW photovoltaic installed capacity just for one year. However exceeding of

solar quota according to NREAP and reduction of number of green certificates from 6 to 3 from 1<sup>st</sup> January 2014 will play cooling effect. Therefore growth perspectives for this market by 2018 are for balanced growth, which will be not so sharp like in 2012 and 2013.

Turkey is undeveloped photovoltaic market, but much anticipated form solar investors. With latest amendments in law from 2013, Turkish market has highest chances compared to other mentioned SEE countries for sharp and explosive medium term emerging growth in all segments: rooftop residential, roof top commercial and large scale ground mounted. Market growth in the next years will be extreme and 3 GW installed photovoltaic capacity is possible by the end of 2018 according to our best case scenario.

Ukraine. Ukrainian photovoltaic market started to develop very good between 2010 and 2013 due to the highest in the world feed-in tariff and the government support. However the political turmoil from February 2014 and annexation of Crimea by Russia, it will be hard to predict development of this market. Moderate growth perspectives for 2014 and 2015 and possible improvement in case of adequate government support for renewable energy.



## 7 VALUATION METHODOLOGY

The ASSET approach and INCOME Approach were used for calculating the value of the CW Enerji Ltd. The value conclusion is based on the results of the Income Approach under Discounted Cash Flow (DCF) method. Asset approach is used only to benchmark the value estimates and is used with zero weight rate for final value conclusion due to the rapidly growing market in Turkey for services related to the production of renewable energy and photovoltaic energy particularly, and maximizing the potential of the company based on the experience of the management of CW ENERJI in this respect.

**ASSET Approach** (known also as known also as Cost approach or Replacement cost approach) estimates company value by adjusting the asset value and the liabilities value to their fair market value at the date of elaboration of company valuation. Main used method under Asset approach is those of **Net Asset Value (NAV)**. By the method of the Net Asset Value (NAV) was elaborated an adjusted balance sheet, where the company's assets and liabilities are reported at their fair market values (FMV) at the valuation date. For valuation of the company's fixed tangible assets was applied the **Depreciated Replacement Cost (DRC)** method. In conformity with the adjusted balance sheet was determined the value of the company's equity.

**INCOME Approach** involves valuation methods that convert future anticipated economic benefits (e.g., cash flow) into a single present currency amount. Main used method under Income approach those of:

**Discounted Cash Flows (DCF).** The going concern value is defined by the DCF method of the forecast net cash flows and transforming them into present value by accumulating discount rate. On this basis was determined the value of the company's equity. This method requires an analysis of historical and forecast revenues, expenses, capital expenditures, working capital levels and the cost of equity and debt capital. Discounted cash flow method is applied based on a two-stage model that includes a specific projection period of 5 years months (from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2018) and terminal cash flows of the business after 2018. The valuation was based on submitted forecast financial statements prepared by the company's management and signed by the Chief Financial Officer (CFO) of CW Enerji Ltd.

**Summary of the main steps undertaken in the valuation process**

- We obtained the unaudited financial statements (balance sheets) of the Company for the years ended 31 December 2011, 31 December 2012 and 31 December 2013. Financial statements were not made and delivered according to IFRS (International Financial Reporting Statements), but provided enough information to convert them according IFRS standards and to perform company valuation.
- We obtained the business plan, company presentation and references, product catalog, sales forecast of CW Enerji Ltd. for 2014, sales report of CW Enerji Ltd. for 2013, projects sales list for 2011, 2012, 2013 and pipeline of project sales forecast for 2014 of CW Enerji Ltd.
- We also obtained excerpt from commercial registry of Turkey about CW Enerji Ltd.

**For the purpose of the value calculation we have undertaken the following main steps:**

- Analyzed the financial statements of the Company for 2011, 2012 and 2013.
- Assisted the management to compile the financial forecast of the period of 5 years starting at 1 January 2014 and ending at 31 December 2018 based entirely on data assumptions provided by the Company's management for production capacities, investment program, revenue, expenses, output and input prices, etc.
- Derived future cash flows and performed calculations under the Asset approach, where the Depreciation Replacement Cost (method) was used, and under the Income approach, where the Discounted Cash Flow (DCF) method was used to establish the company value conclusion.

## 8 HISTORICAL FINANCIALS

The profits realized through the sales of the Company's services presented on the next table were accounted for in the statements provided for 2011, 2012 and 2013. Because the company is young, in this respect the historical financial statements of CW Enerji Ltd. are not representative of the Company's full business potential to generate revenues and returns (please refer to the estimation of value under Income approach in Chapter 10.2).

<b>PROFIT AND LOSS SHEET FOR 2012 AND 2013</b>				
<b>( 1 TRY)</b>				
	<b>Previous Period</b>		<b>2013</b>	
	<b>01.01.2012 - 31.12.2012</b>		<b>01.01.2013 - 31.12.2013</b>	
A-GROSS SALES		0.00		3,253,539.54
1-DOMESTIC SALES	0.00		3,184,781.90	
2-FOREIGN SALES	0.00		57,804.00	
3-OTHER INCOME	0.00		10,953.64	
B-SALES FROM DISCOUNTS		0.00		5,870.01
1-RETURNS FROM SALES(-)	0.00		5,870.01	
NET SALES		0.00		3,247,669.53
C-COST OF SALES(-)		0.00		2,463,862.68
1-COST OF COMMERCIAL GOODS SOLD(-)	0.00		2,463,862.68	
GROSS PROFIT OR LOSS OF SALES		0.00		783,806.85
D-OPERATING EXPENSES(-)		108.00		712,822.28
1-GENERAL ADMINISTRATION EXPENSES(-)	108.00		712,822.28	
PRERATING PROFIT OR LOSS		-108.00		70,984.57
E-ORDINARY INCOME OR PROFITS FROM OTHER ACTIVITIES		0.00		460.29
1-PROFIT FROM FOREIGN CURRENCY INCOME	0.00		460.29	
F-FINANCING EXPENSES(-)		0.00		21,960.64
1-SHORT TERM FINANCIAL EXPENSES(-)	0.00		21,960.64	
PROFIT OR LOSS OF THE PERIOD		-108.00		49,484.22
G-LEGAL OBLIGATIONS		0.00		9,285.14
1-PROFIT OF THE PERIOD, TAXES AND OTHER STATUTORY OBLIGATIONS.(-)	0.00		9,285.14	
<b>PROFIT/LOSS OF THE PERIOD</b>		<b>-108.00</b>		<b>40,199.08</b>

**Table 4: Profit and loss sheet of CW Enerji Ltd. for 2012 and 2013**

## 9 FORECAST FINANCIAL STATEMENTS

Using historical internal accounting and sales data, in addition and in consideration to external photovoltaic market and economic indicators, forecast financial statements have been elaborated by the management of CW Enerji Ltd. They represent company's vision for business development and Net Cash Flow (NCF) for the period 2014 – 2018.

Source data		2014	2015	2016	2017	2018
Revenue from company's operation	TRY	880,000	1,760,000	4,400,000	11,880,000	35,640,000
Expenses for company's operation	TRY	280,000	420,000	924,000	2,587,200	8,279,040
Interests on the long-term debt (8 % interest rate p.a.)	TRY	89,600	80,640	71,680	62,720	53,760
Taxes (20 % corporate tax)	TRY	102,080	251,872	680,864	1,846,016	5,461,440
<b>Financial benchmarks</b>						
Net earnings (profit) after interests and taxes	TRY	408,320	1,007,488	2,723,456	7,384,064	21,845,760
Depreciation	TRY	95,000	95,000	95,000	95,000	95,000
Investments (purchase of fixed tangible assets)	TRY	1,000,000	0			
Changes in working capital	TRY	500,000	0	0	0	0
<b>Net cash flow (NCF)</b>	TRY	<b>3,320</b>	<b>1,102,488</b>	<b>2,818,456</b>	<b>7,479,064</b>	<b>21,940,760</b>

**Table 5: Forecast financial statements of CW Enerji Ltd. for 2014 - 2018**

We have assessed carefully numbers provided by the management of CW Enerji Ltd. After that we have done our own market research and looked at companies from neighbor markets from SEE region, which might be compared to CW Enerji Ltd., despite those solar markets, are more advanced in terms of installed capacity than Turkey. According to our experience we are confident that forecasted company growth between each year is quite reasonable, compared the expected growth of Turkish photovoltaic market by 2018 and to the company's market share at the moment.

After mid-year review (H1 2014) of Turkish photovoltaic market we confirm that according to our moderate case scenario 1,674 MW cumulative installed PV capacity to be installed by 2018 and 2,927 MW according to our best case scenario, whilst Turkish solar industry associations GENSED and Li-DER forecast approximately 4,500 MW by 2018 and up to 10,000 MW by 2023. Therefore our projections are compatible with the projected growth rates of Turkish photovoltaic industry associations and other reputable analysts. Thus even our best case scenarios may be considered as conservative.

Projected Growth*	2014	2015	2016	2017	2018
	1 EUR	1 EUR	1 EUR	1 EUR	1 EUR
<b>Moderate case</b>	305,241,400	566,974,800	1,013,587,400	1,389,127,000	2,495,601,000
<b>Optimal case</b>	578,626,600	1,030,096,600	1,371,098,000	2,081,381,000	2,958,693,000
<b>Best case</b>	930,207,000	1,479,719,000	1,733,168,000	3,280,235,000	4,361,081,000
<b>Net Profit**</b>	141,677	349,575	944,975	2,562,100	7,579,970

**Table 6: Projected PV market growth in Turkey and Net Profit growth of CW Enerji Ltd (2014 – 2018)**

\* Projected growth compares cumulative market value of Turkish PV market between 2014 and 2018 according to moderate (low), optimal (mid) and best (high) scenario of Inea Consulting Ltd. to Net Profit of CW Enerji Ltd. between 2014 and 2018. In order to calculate cumulative market value for each year projected capacity in MW is multiplied by 1.49 mln. EUR per MW. These 1.49 mln. EUR represent the average cost to build and launch into operation 1 MW photovoltaic capacity including in this assumption turn-key cost of the PV power plant, licensing and permitting expenses, cost of land or leasing of land, project management, grid connection costs, and other necessary expenses.

\*\* Numbers from "Net profit" row are get from "Net earnings (profit) after interests and taxes" row of NCF forecast from Chapter 9.

Compared to cumulative installed capacity at the end of 2013 (89 MW) Turkish PV market will increase its volume by 2018 approximately 30 fold.

Furthermore we have held a number of interviews with management of CW Enerji Ltd. and several times discussed in details their sales and growth forecast. Outcome of these interviews re-confirmed our opinion that company's management has enough knowledge, skills, professional experience and overall capability to achieve its growth targets.

We have inspected list with clients of CW Enerji for 2014. With most of them the company has signed contracts for delivery of photovoltaic equipment and for EPC services. Product portfolio of CW Enerji Ltd. has good diversification and would provide the company's flexibility to determine and adapt its product sales according to the relative market conditions, demand and prices at every moment, and to intensify delivery and sales of higher-margin photovoltaic equipment and services.

Regarding interest rate for the 1,000,000 TRY long-term bank loan the company's management has stated 8 % p.a. This is fully compatible with our observations for average interest rate about long-term bank loans and project finance over the photovoltaic markets of countries from SEE region. Furthermore a lot of suppliers of equipment (PV modules, inverters, etc.) offer low interest rate finance or even 0 % interest rate finance. We have information that Bank of China offers interest rates between 4 % and 5 % for foreign private companies which trade with Chinese PV modules and inverters or which build PV power plants with Chinese equipment in Turkey, Romania and Bulgaria. Therefore even in one country like Turkey domestic interest rates for bank loans to be higher than 8 %, then it is more logical from economic point of view to use international bank loans or own financial leasing products of equipment manufacturers than using more expensive domestic loans.

The increase in the profitability levels during whole forecasted period will be maintained and driven by achievement of sales targets of CW Enerji Ltd. as well-organized and competitive company with sound management team, operating in fast growing market under favorable market conditions. Growth of Turkish PV market in FY2017 and FY2018 will be underpinned by fast growing energy needs of Turkish economy combined with increase of electricity prices, and the conjunction of fact that by 2016 the first licensed 600 MW should be installed, followed by start of next application process scheduled by EPDK (EMRA) between April 1<sup>st</sup> and April 7<sup>th</sup>, 2015. The application procedure will comply with guidelines brought by the country's Electricity Market Law No. 6446,. This second application process will target installation of further 2,500 MW in licensed market segment, which should be installed by the end of 2018. Therefore between 2016 and 2018 we expect large photovoltaic capacity to be installed in Turkey.

On the other hand unlicensed market segment under 1 MW photovoltaic installation will develop rapidly for residential PV installations below 30 KW and commercial ground mounted and rooftop PV installations. The energy hungry company owners from textile, machinery, automotive, chemical, mining, tourism and other leading industry sectors will

quickly follow benefits from rooftop and ground mounted PV installations because of growing electricity prices, shortages of electricity supply and interruptions of supply in many locations in Turkey.

Therefore assuming all the above mentioned considerations we may conclude that projected company sales, revenue and operating expenses are consistent with estimated demand and respective photovoltaic market environment in Turkey for the company's products and services during the projection period.

## 10 ESTIMATION OF VALUE

### 10.1 ESTIMATION OF VALUE UNDER ASSET APPROACH

For valuation of company's assets and liabilities under Asset approach (known also as Cost approach or Replacement cost approach) is used Net Asset Value (NAV) method.

#### 10.1.1 Valuation of assets

##### 1.) Fixed tangible assets

1.1.) Real property - **0 TRY**

The company does not own realties – land and buildings as of 31.12.2013.

1.2.) Vehicles/cars - **110,750 TRY**

1.3.) Office equipment - **37,047 TRY**

**For valuation of the company's fixed tangible assets was applied the Depreciated Replacement Cost (DRC) method**

The approach is based on the principle of cost assessment for the replacement of a certain facility, equipment or machine with another suitable one, with the same designation and usefulness for the investor, assuming that he would not pay more. In order to transform the replacement cost of a new asset into a Fair Market Value (FMV) of the delivered to the site asset, it is necessary to depreciate the replacement cost, i.e. to determine the depreciation of the asset, due to physical, obsolete and economic wearing and tear, relevant to the valuated asset. This business valuation procedure changes the stated values of a company's assets and liabilities to reflect their current fair market values (FMV). This method adjusts asset and liability values either up or down, so they reflect the true market values.

The basic principle of the Depreciated Replacement Cost (DRC) method is realized by the formula:

**FMV = RV x C<sub>phwo</sub> x C<sub>ma</sub> , where**



**RC** - Replacement Cost (new) of the delivered on the site asset (machinery, equipment, etc.)

**C<sub>phwt</sub>** - Coefficient of Physical Wearing and Tear, reflecting the effective physical wearing and tearing of the valuated asset, compared to the similar one, assumed as a base.

**C<sub>ma</sub>** - Coefficient of Obsolescence, reflecting the loss of value due to the appearing of new and more modern assets with the same designation and capacity. In general this coefficient is based on the term of operation, as follows:

Operation	Coefficient
Up to one year	1.00
Up to five years	1.0 – 0.6
Up to ten years	1.0 – 0.5
Up to fifteen years	0.9 – 0.3
Up to twenty years	0.6 – 0.1
Over twenty years	0.1 – 0.05

**Table 7: Coefficient of obsolescence**

After detailed survey of prices for similar assets and the corresponding accessories with similar technical characteristics, we accept replacement cost of the assessed assets being according to their acquisition price (historical cost).

According to the adopted maximum exploitation life of the assets (10 to 15 years.) and taking into account the year of production and the exploitation rate, we determined the corresponding Coefficient of Physical Wearing and Tearing (**C<sub>phwt</sub>**) and Coefficient of Obsolescence (**C<sub>o</sub>**), and the **fair market value (FMV)** for each asset in **Appendix I**.

The adjusted value of assets by the Cost Approach to their fair market value (FMV), we determined to be as follows:

➤ Vehicles/cars -	<b>112,858 TRY</b>
➤ Office equipment -	<b>36,457 TRY</b>

#### **1.2.) Fixed intangible assets**

The company owns fixed intangible assets – rights over property, software and a web site:

**41,049 TRY**

In the adjusted balance sheet they are reported with the same value.



### **2.3.) Short term financial assets.**

The company does not own short-term financial assets.

### **2.4.) Cash and cash equivalents**

The company has finances in cash, in bank deposits and received checks at the amount of:

**190,405 TRY**

In the adjusted balance sheet they are reported with the same value.

## **10.1.2 Valuation of liabilities**

The liabilities of the company are not usually adjusted in valuation process and enter with their full value in the adjusted balance sheet. CW Enerji Ltd. as of 31.12.2013 has the following liabilities:

### **1.) Long-term payables:**

- Payables under leasing contracts:	<b>92,554 TRY</b>
-------------------------------------	-------------------

### **2.) Short-term payables:**

- Payables for short-term loans from banks:	<b>119,666 TRY</b>
- Payables to suppliers:	<b>77,457 TRY</b>
- Payables to the company's employees:	<b>14,149 TRY</b>
- Payables for promissory notes:	<b>235,302 TRY</b>
- Fiscal payables (taxes):	<b>14,455 TRY</b>
- Payables for social security:	<b>7,216 TRY</b>
- other commercial payables:	<b>226,554 TRY</b>
- advance received for client's orders:	<b>1,333,128 TRY</b>

Retained (uncovered) losses from previous periods (years) amounting to 3,058 TRY and the profit from the last reporting period to the amount of 40,199 TRY were not included in the adjusted balance sheet as they do not carry economic value.

### 10.1.3 Calculation of Net Asset Value (NAV)

By the method of the **Net Asset Value (NAV)** was elaborated an adjusted balance sheet, where the company's assets and liabilities are reported at their fair market values (FMV) at the valuation date. The method was implemented by the following formula:

**NAV** = (FA + CA) – (loans + payables), where:

**NAV** – Net asset value /equity market value/;

**FA** – Fixed assets market value;

**CA** – Current assets market value.

CW ENERJI TICARET VE SANAYI LTD has a registered capital of 100,000 TRY. After elaboration of adjusted balance sheet (**Appendix III**), the value of the company's equity was determined by NAV method, as follows:

➤ <b>Assets:</b>	<b>2,259,440 TRY</b>
➤ <b>Liabilities:</b>	<b>2,028,227 TRY</b>
➤ <b>Equity:</b>	<b>138,659 TRY</b>

## 10.2 ESTIMATION OF VALUE UNDER INCOME APPROACH AND DCF METHOD

The principle base of the income approach is: The value of an enterprise equals the sum of the current values of the reasonably expected future incomes in the long run.

Discounted Cash Flow (DCF) method is one of the most fundamental and pervasive concepts in finance, and one of its biggest advantages is that it accounts for the fact that money we receive today can be invested today, while money we have to wait for cannot. In other words, DCF accounts for the time value of money. As such, it provides an estimate of what we should spend today (e.g., what price we should pay) to have an investment worth a certain amount of money at a specific point in the future. The determination of the value of an operating enterprise by the DCF method implies the solving of two main tasks:

- 1) Determination of net cash flows in a forecast period (5-year in this case) and beyond.  
Net cash flows are determined, by increasing the forecasted net profit after tax and

surcharges by the forecast depreciation cost and the long-term debt, which will be used to buy fixed assets, and by decreasing the result by the forecast expenditures for repayment of the principle of the loan. The source for the forecast income and cost data is the company itself and they reflect the expectations of the management team for future development.

- 2) Their transformation into current value by way of discounting at a properly chosen discount rate, reflecting the general risk inherent for the relevant enterprise at the valuation date is calculated under the following formula:

$$EV = FV + TV - D$$

where,

EV - enterprise value

FV - forecast value (value in the forecast period)

TV - terminal value (value beyond the forecast period)

D - interest-bearing debt

$$FV = \frac{NCF1}{(1+Dr)} + \frac{NCF2}{(1+Dr)^2} + \frac{NCF3}{(1+Dr)^3} + \frac{NCF4}{(1+Dr)^4} + \frac{NCF5}{(1+Dr)^5}$$

NCF – net cash flow during the relevant forecast year

NCF = net profit + depreciation + long-term borrowings – investments + change in working capital

Dr (r) – discount rate, determined by the cumulative risk method

$$Dr (r) = Rf + Rg + Rs \text{ where,}$$

Rf – risk-free rate of return. It is determined by the interest rate of the long-term treasuries and is - 4%

Rg – general (capital) risk allowance, reflecting the situation in economics to date and the existing macro-economic conditions - 4%

Rs – specific risk allowance, which is relatively low in the long run - 2%, as the company does business in a perspective field with high growth potential, supported by the state-production of renewable energy. Therefore our calculation based on the above consideration for discount rate value is as follows:

$$Dr = 4 + 4 + 2 = 10 \%$$

We based our calculation of discount rate on our previous experience with deals and finance of photovoltaic power plant projects in the countries from SEE region. For more clearance we can give examples from our previous practice and will mention three cases about companies, which already have received different types of project financing under discount rates calculated by our services for company valuations, asset valuations and financial models:

#### Case 1: Intersolar Varna Plc.

We used 8 % discount rate. The company received 11,697,660 EUR long-term bank loan at 6.75 % interest rate p.a. from Union Bank Plc. in 2011, and was publicly listed on Bulgarian Stock Exchange in 2012 with its 5 MW photovoltaic power plant project located in Bulgaria, which is grid connected.

#### Case 2: Greenergy Bulgaria 1 Ltd.

We used 9 % discount rate. The company received 563,900 EUR in 2012 under collective investment scheme from Citadel Trustee UK Ltd (with 2 bln. EUR assets under management), and 768,000 EUR long-term bank loan at 7.5 % interest rate p.a. from UniCredit Bulbank Plc. in 2013 for 1.8 MW photovoltaic power plant project located in Bulgaria, which is grid connected.

#### Case 3: Eldiva Ltd.

We used 8 % discount rate. The company received 1,380,440 EUR private equity loan under 6 % interest rate p.a. in 2012 for its 1.12 MW photovoltaic power plant project located in Bulgaria, which is grid connected.

Other assumptions supporting selected discount rate are: i) prices of electricity for households and businesses in Turkey are between 20 % and 50 % higher than in Bulgaria;<sup>89</sup>  
<sup>90</sup> ii) Spot market price on the wholesale electricity market in Turkey is at least 15 % - 20 % higher than the price in Bulgaria.<sup>91</sup> iii) Turkish electricity consumption hit a record high on

<sup>89</sup> [http://ec.europa.eu/energy/observatory/electricity/doc/20130814\\_q2\\_quarterly\\_report\\_on\\_european\\_electricity\\_markets.pdf](http://ec.europa.eu/energy/observatory/electricity/doc/20130814_q2_quarterly_report_on_european_electricity_markets.pdf)

<sup>90</sup> <http://www.argusmedia.com/~media/Files/PDFs/Samples/Argus-European-Electricity.pdf?la=en>

<sup>91</sup> <http://www.platts.com/latest-news/electric-power/london/turkish-power-bayram-holiday-cuts-liquidity-calms-26844662>

July 10, reaching 807.8 million kilowatt-hours a day, according to Energy Minister Taner Yıldız, who added that instant peak demand also broke a record at 39,088 MW.<sup>92</sup> This demand for electricity will underpin electricity prices to stay at level close or higher than the current in the next 4 – 5 years until building of new power generation facilities to meet continuously increasing demand; iv) Turkey's exports in May rose by 5.8 percent compared to the same month of the previous year and reached an all-time high of USD 13.4 billion, while the export total for the first 5 months of the year climbed to USD 67.9 billion, a solid 8 percent increase from a year earlier.<sup>93</sup> Export growth will support Turkey to meet or exceed its 4.2 % GDP growth forecast for 2014; v) Growth rates for each newly established PV industry in the first few years of market formation are much higher the other industry or GDP growth rates. This is clearly visible from Chapter 6.

After that we continue with calculation of terminal value (TV). It is the value of an asset or a company at a specified, future valuation date, taking into account factors such as interest rates and the current value of the asset, and assuming a stable growth rate. In addition to asset applications, terminal value can also refer to the value of an entire company at a specified future valuation date. There are several ways to estimate a terminal value of cash flows, but one well-known method is to value the company as perpetuity with the following formula:

$$TV = \frac{NCF_6}{(1 + Dr)^5}$$

where,

**g** – growth of NCF beyond the forecast period = 5%, i.e. the management of CW Enerji Ltd. foresee constant growth of NCF in the long run beyond the forecasted period.

**NCF6** = NCF5 \* 1.05 (the 5 % growth per year, which company's management has assumed after 2018)

The formula simplifies the practical problem of projecting cash flows far into the future. The formula rests on the assumption that the cash flow of the last projected year (2018) will stabilize and continue at the same rate forever. This is an average of the growth rates, not one expected to occur every year into perpetuity. Some growth will be higher or lower, but

<sup>92</sup> <http://www.py-magazine.com/news/details/beitrag/-turkey-hits-all-time-electricity-consumption-record-100015763/#ixzz3AG6q6lDr>

<sup>93</sup> <http://www.invest.gov.tr/en-US/Infocenter/news/Pages/050614-turkey-exports-up-8-pct-jan-may-2014.aspx>

the expectation is that future growth will average the long-term growth rate assumption of 5 % per year.

This long-term growth rate assumption of 5 % per year is based on the CW Enerji's management forecasts and on the fact that during the forecasted serious growth of Turkish PV market till 2018 the company will be engaged to provide mainly EPC services and delivery of photovoltaic equipment, which brings more profit. After 2018 it is supposed that the company will be more engaged with O&M services to the photovoltaic power plants, which they have built in the period between 2014 and 2018 and to other PV plants built by other EPC contractors. Therefore 5 % growth rate per year is normal and even conservative assumption for one O&M business in photovoltaic sector compared to other comparable companies engaged with O&M services in photovoltaic sector from South-East Europe (SEE) region.

On the basis of submitted data have been determined the forecast financial results for the next 5 years (from 2014 to 2018). Source data for revenue, expenses, depreciation and investments have been provided by the company's management.

Expenses consist of operating expenses for the implementation of solar energy projects and the costs about personnel hiring. On the revenue side, significant increase is forecasted taking into consideration the expected increase in activity and expected high growth rate of Turkish photovoltaic market for the next five years.

Change in working capital through increase of company capital with 500,000 TRY is planned for 2014 by the company's management. Money for this increase will come from shareholders of CW Enerji Ltd. Other changes in working capital are not assumed for year between 2015 and 2018, because the CW Enerji Ltd. plans to use only its own generated revenue for company operation.

Depreciation costs are constant through the forecast period. Investments shall be provided once in the first year of the forecast period, to ensure a base for the revenue growth in the coming years. For this purpose a long-term loan of 1,000,000 TRY is planned, which will be utilized for the purchase of fixed assets, which are necessary to support planned increase of sales and all activities, which will assure projected company growth in the period 2014 - 2018.



According to the above calculations and calculations presented in **Appendix III** the value of the Company was determined to the amount of **307,856,000 TRY** by due application of the DCF method.

### **10.3 FAIR MARKET VALUE (FMV) OF CW ENERJI LTD.**

For final valuation of the company's equity were used the values obtained by both methods of valuation, weighted by the selected weight factors. For their determination were taken into account the following facts:

- the principal earnings of the Company come from solar energy projects; the costs of production, external services and depreciation are relatively low, which implies that in a favourable economic situation the short-term gains shall be preserved;
- the Company has signed long-term contracts with clients. Its activity is focused on sector with significant growth potential in Turkey (due to fundamental reasons explained in details in Chapters 4, 5 & 6), which in fact implies successful further development.
- Company value is sensitive and may be impacted negatively to a number of factors as follows: i) negative impact over the revenue forecast may have negative changes in renewable energy legislation of Turkey; ii) missing of CW Enerji Ltd. to meet its sales targets; iii) political instability and vulnerability, which may worsen economic environment in Turkey; iv) decrease of feed-in tariff, which could result in outflow of investors mostly from licensed market segment; v) increase of prices of PV modules and inverters; vi) lack of enough company history of CW Enerji Ltd., but the company managers have previous experience in renewable energy industry.
- Company value is sensitive and may be impacted positively to a number of factors as follows: i) exceeding of sales targets of CW Enerji Ltd.; ii) increase of feed-in tariff; iii) increase of size limit for projects eligible for unlicensed market segment from 1 MW to 2.5 MW. Such increase is already into consideration amongst the major Turkish government stakeholders; iv) decrease in the cost of PV modules and inverters, which will reflect in more order from end customers; v) further increase of electricity prices, which spread the grid parity to whole territory of Turkey and will push more households and businesses to invest in photovoltaic power plants for own consumption.

On the next table you may see our sensitivity analysis over the two key company value drivers regarding DCF method. Regarding deviation of revenue forecast we have selected -/+ 5 % range, whilst regarding discount rate we have selected +/- 2% range.

Income approach (DCF method)	Low in TRY	Base (Mid) in TRY	High in TRY
Revenue forecast (-/+ 5 %)	233,683,300	307,856,000	381,594,800
Discount factor (+/- 2%)	281,537,700	307,856,000	337,196,700

**Table 8: Sensitivity analysis of DCF method**

Based on the data for built photovoltaic installations in Turkey in 2013 we estimate that by means of provided EPC services for installed capacity market share of CW Enerji Ltd. for 2013 has been approximately 12 % amongst other EPC companies operating on Turkish PV market. They have installed by 2013 some 1.29 MW out 11 MW total installed in Turkey for 2013. By 2018 when we expect photovoltaic market value of Turkey to reach up to 4.36 bln. EUR by means of cumulative installed PV capacity, therefore with the company value of 49.8 mln. EUR, we expect that CW Enerji Ltd. will at least keep its market share from 2013.

Furthermore Turkey was ranked as the world's third most attractive emerging photovoltaic (PV) market, followed by Romania according world consulting firm IHS emerging PV markets attractiveness survey in Q4 2013.<sup>94</sup> Rising energy prices have pushed photovoltaics to reach grid parity more quickly than expected.

Methods of valuation	Value in TRY	Weight factor	Weighted value in TRY
NAV method	138,659	0	0
DCF method	307,856,000	1	307,856,000
<b>Fair market value (FMV)</b>			<b>307,856,000</b>

**Table 9: Fair market value calculation**

Major importance and priority is given to the Discounted Cash Flow (DCF) method, as it presents a more realistic picture of the fair market value of a fast growing and profit gaining company in fast growing photovoltaic market in the long run, while the Net Asset Value (NAV) method is more suitable for companies with large amounts of fixed assets, but with limited income and declining functions or working in ultimately futile sectors of economy.

<sup>94</sup> [http://www.pv-magazine.com/opinion-analysis/publishers-comment/blogdetails/beitrag/south-africa-worlds-most-attractive-emerging-country-for-solar\\_100014074/#axzz33rzug9QW](http://www.pv-magazine.com/opinion-analysis/publishers-comment/blogdetails/beitrag/south-africa-worlds-most-attractive-emerging-country-for-solar_100014074/#axzz33rzug9QW)

On the basis of the performed sensitivity analysis, calculations and assumptions we determine the fair market value (FMV) of the 100 % of the equity of CW Enerji Ltd. as follows:

➤ Equity:	307,856,000 TRY
➤ 1 company share of 1,000 TRY nominal value:	3,078,560 TRY

Respective fair market value (FMV) represented in EUR is as follows:

➤ Equity:	106,888,000 EUR
➤ 1 company share of 1,000 TRY nominal value:	1,066,980 EUR

**Note:** Used currency exchange rate for this calculation is EUR/TRY - 0.34659

In our opinion and past experience the above estimated company value of CW Enerji Ltd. is around the average value of comparable companies engaged with photovoltaic EPC business from South-East Europe region. Furthermore the company is applying innovative approaches in its business and performs R&D activity for creation of more effective concentrated photovoltaic modules. CW Enerji Ltd. have support and work in close co-operation with TÜBİTAK (The Scientific and Technological Research Council of Turkey) about its R&D activities.

The probability for high growth of Turkish PV market by 2018 is supported by the following 5 main reasons: i) growing energy needs of Turkish economy and industry; ii) quickly growing electricity prices for businesses and households; iii) grid parity with electricity cost for households and businesses in Southern parts of Turkey; iv) growing population of Turkey, which will result in more energy consumption in the next 20 years; v) excellent opportunities existing in non-licensed market segment, which enables photovoltaic installations below 1 MW with simplified permitting procedures. Increase of size limit for projects eligible for unlicensed market segment from 1 MW to 2.5 MW amongst the major Turkish government stakeholders.

## 11 LIST OF ABBREVIATIONS

Some of the following definitions are used throughout this Report:

<b>"RES"</b>	means Renewable Energy Sources
<b>"Eurostat"</b>	means European Statistics Institute
<b>"Turkstat"</b>	Means Turkish National Statistical Institute
<b>"MW"</b>	means mega watt electrical energy
<b>"KWp"</b>	means kilo watt peak electrical energy
<b>"EU"</b>	means European Union
<b>"pV"</b>	means Photovoltaic
<b>"EPIA"</b>	means European Photovoltaic Energy Association
<b>"Grid parity or socket parity"</b>	Means when an alternative energy source can generate electricity at a levelized cost (LCoE) that is less than or equal to the price of purchasing power from the electricity grid. The term is most commonly used when discussing renewable energy sources, notably solar power and wind power.
<b>"CEE"</b>	means Central and Eastern Europe
<b>"SEE"</b>	means South-Eastern Europe
<b>"EV"</b>	means Enterprise Value
<b>"EBITDA"</b>	means Earnings before interest, tax, depreciation and amortization
<b>"GDP"</b>	means Gross domestic product

<b>"DCF"</b>	means Discounted cash flow
<b>"DSO"</b>	means Distribution System Operator;
<b>"EEA"</b>	European Economic Area;
<b>"EIA"</b>	means Environment Impact Assessment;
<b>"EL"</b>	means the Energy Law;
<b>"JI Project"</b>	means Joint Implementation Project;
<b>"Kyoto Protocol"</b>	means the Kyoto Protocol to the United Nations Framework Convention on Climate Change;
<b>"TETAS"</b>	means the Turkish Electricity Trading and Contracting Company;
<b>"SDA"</b>	means Spatial Development Act (Law on Structure of Territory);
<b>"TEDAS"</b>	means the Turkish Electricity Distribution A.Ş.;
<b>"MoEF"</b>	means the Ministry of Environment and Forestry;
<b>"TEIAS"</b>	means Turkish Electricity Transmission Company;
<b>"TÜBİTAK"</b>	means The Scientific and Technological Research Council of Turkey
<b>"MoAF"</b>	means Ministry of Agriculture and Foods
<b>"SPO"</b>	means State Planning Organization
<b>"MENR"</b>	means Ministry of Energy and Natural Resources
<b>"PPA"</b>	means power purchase agreement;
<b>"EUAS"</b>	means Turkish Electricity Generation Co. Inc.

**“Regulator” or “EMRA”** means the State Energy and Water Regulatory Commission;  
**or “EPDK”**

**“REL”** means the Law on use of Renewable Energy Sources to  
Produce Electrical Energy;

**“Reviewed Documents”** means all source documents;

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## APPENDIX I. VALUATION OF FIXED ASSETS

## VALUATION OF FIXED ASSETS OWNED BY CW ENERJI TICARET LTD TO 15.08.2014

Inventory №	Asset name	Acquisition date	Historical cost	C <sub>phwt</sub>	C <sub>o</sub>	Fair market value (FMV)
<b>Vehicles</b>			<b>TRY</b>			<b>TRY</b>
254 2013 001	Skoda Rapid Active (07FIH25)- new, overall mileage - 36 383 km.	31.3.2013	41,650.01	0.90	1.00	37,485.01
254 2013 002	Skoda Roomster Active (07FIG97)- new, overall mileage - 65 400 km.	31.3.2013	38,650.02	0.90	1.00	34,785.02
254 2013 003	Ford Transit (07DDJ53)- used, overall mileage - 163 381 km.	20.6.2013	21,186.44	0.90	0.90	17,161.02
254 2013 004	Skoda Roomster Panorama 1.6 (0.7ADJ21)- new, overall mileage - 39 512 km.	30.6.2013	26,030.00	0.90	1.00	23,427.00
	<b>Total vehicles</b>		<b>127,516.47</b>			<b>112,858.04</b>
<b>Office equipment</b>						
255 2013 001	Curtain	10.3.2013	1,592.59	0.80	0.90	1,146.66
255 2013 002	Arm chair-Table Set	31.3.2013	10,678.02	0.80	0.90	7,688.17
255 2013 003	LG Led TV	10.4.2013	1,143.22	0.90	1.00	1,028.90
255 2013 004	550 Color Printer-Scanner-Pho.	30.4.2013	970.43	0.90	1.00	873.39
255 2013 005	Samsung Dishwasher	30.4.2013	801.69	0.90	1.00	721.52
255 2013 006	Samsung Washing Machine	30.4.2013	1,567.80	0.90	1.00	1,411.02
255 2013 007	Elektrolux Refrigerator	30.4.2013	1,027.12	0.90	1.00	924.41
255 2013 008	Led TV	10.5.2013	1,287.33	0.90	1.00	1,158.60
255 2013 009	Karel MS48 Power Station	31.5.2013	1,694.92	0.90	1.00	1,525.43
255 2013 011	Asus Computer i7	31.5.2013	1,426.73	0.90	0.90	1,155.65
255 2013 012	Asus I7 Computer	31.5.2013	1,426.73	0.90	0.90	1,155.65
255 2013 015	Seating Group	31.5.2013	3,000.00	0.80	0.90	2,160.00
255 2013 016	Table Set	31.5.2013	1,800.00	0.80	0.90	1,296.00
255 2013 017	Roller Blind	10.6.2013	1,574.07	0.8	0.7	881.48
255 2013 018	Light Shelf Systems		1,940.00	0.9	0.9	1,571.40
255 2013 019	Conveyor Table	10.6.2013	1,250.00	0.9	1	1,125.00
255 2013 023	DK-250 Assembly Set	10.10.2013	13,127.90	0.9	0.9	10,633.60
	<b>Total office equipment</b>		<b>46,308.55</b>			<b>36,456.88</b>

Notes: C<sub>o</sub> - Coefficient of obsolescenceC<sub>phwt</sub> - Coefficient of physical wear and tear

## APPENDIX II. ADJUSTED BALANCE SHEET

## ADJUSTED BALANCE SHEET FROM 2013 TO 11.06.2014 OF CW ENERJI LTD.

ASSETS				
No	SECTIONS OF BALANCE SHEET	Balance value to 31.12.2013 TRY	Adjustment TRY	Adjusted value to 15.08.2014 TRY
1	2	3	4	5
<b>A.</b>	<b>FIXED ASSETS</b>			
<b>I.</b>	<b>Tangible fixed assets</b>			
1	Lands			
2	Buildings and constructions			
3	Machinery and production (manufacturing) equipment			
4	Equipment			
5	Vehicles	110,750	2,108	112,858
6	Office equipment and computers	37,047	-590	36,457
7	Other tangible fixed assets			
8	Fixed assets in progress – given advances			
	<b>Group I Total:</b>	<b>147,797</b>	<b>1,518</b>	<b>149,315</b>
<b>II.</b>	<b>Intangible fixed assets</b>			
1	Property rights	37,825	0	37,825
2	Software			
3	Research and development (R&D)			
4	Other intangible fixed assets (web site)	3,224	0	3,224
	<b>Group II Total:</b>	<b>41,049</b>	<b>0</b>	<b>41,049</b>
<b>III.</b>	<b>Long-term financial assets</b>			
1	Shares and participations in:			
	- daughter companies			
2	Investment real estates and long-term investments			
3	Other long-term securities			
4	Long-term receivables from:			
	-related companies			
	-deposits and guarantees	1,241	0	1,241
	-other long-term receivables			
	<b>Group III Total:</b>	<b>1,241</b>	<b>0</b>	<b>1,241</b>
<b>IV</b>	<b>Goodwill</b>			
1	Positive goodwill			

**COMPANY VALUATION: CW ENERJI LTD.**

<b>2</b>	<b>Negative goodwill</b>			
	<b>Group IV Total:</b>	0	0	0
<b>V</b>	<b>Deferred expenses</b>			
	<b>Section A Total (I + II + III+IV+V)</b>	190,087	1,518	191,605
<b>B.</b>	<b>CURRENT ASSETS</b>			
<b>I.</b>	<b>Inventories</b>			
<b>1</b>	Materials			
<b>2</b>	Production (finished goods)			
<b>3</b>	Merchandise	1,145,462	0	1,145,462
	<b>Group I. Total</b>	1,145,462	0	1,145,462
<b>II</b>	<b>Short-term receivables</b>			
<b>1</b>	From related parties			
<b>2</b>	From domestic clients	238,687	0	238,687
<b>3</b>	From advances given by suppliers	101,425	0	101,425
<b>4</b>	From promissory notes	300,245	0	300,245
<b>5</b>	From given commercial deposits, guarantees and collaterals	11,634	0	11,634
<b>6</b>	Deferred advances - advance payment of corporate income tax	686	0	686
<b>7</b>	Deferred VAT and VAT for refunding	79,291	0	79,291
<b>8</b>	Taxes for refund			
<b>9</b>	Other short-term receivables			
	<b>Group II. Total</b>	731,968	0	731,968
<b>III</b>	<b>Current financial assets</b>			
	<b>Group III. Total</b>	0	0	0
<b>IV</b>	<b>Liquid assets (Cash)</b>			
<b>1</b>	Cash and credit cards	16,559	0	16,559
<b>2</b>	Cash in bank deposits	171,146	0	171,146
<b>3</b>	Blocked funds			
<b>4</b>	Cash equivalents - received cheque	2,700	0	2,700
	<b>Group IV. Total</b>	190,405	0	190,405
<b>V</b>	<b>Deferred expenses</b>			
	<b>Group V. Total</b>	0	0	0
	<b>Section B Total (I + II + III + IV+V)</b>	2,067,835	0	2,067,835
	<b>Total assets (A + B)</b>	2,257,922	1,518	2,259,440
<b>C</b>	<b>OFF BALANCE SHEET ASSETS</b>			

COMPANY VALUATION: CW ENERJI LTD.

LIABILITIES				
	SECTIONS OF BALANCE SHEET	Balance value to 31.12.2013 TRY	Adjustment TRY	Adjusted value to 12.08.2014 TRY
1	2	3	4	5
<b>A.</b>	<b>Equity</b>			
<b>I.</b>	<b>Shareholder's equity</b>			
1	Registered capital			
	-shareholder's capital	100,000	0	100,000
	-other types of registered capital			
2	Non paid-in capital			
3	Bought-up company's shares			
	<b>Group I. Total</b>	100,000	0	100,000
<b>II</b>	<b>Reserves</b>			
1	Share premium account			
	Revaluation reserve from further assessments of assets			
2	& liabilities			38,659
3	Designation reserves:			
	-general reserves			
	-specialized reserves			
	-other reserves			
	<b>Group II. Total</b>	0	38,659	38,659
<b>III</b>	<b>Profit/Loss</b>			
1	Prior years retained earnings (loss)			
	-retained earnings			
	-retained loss	-3,058		
2	Current year profit	40,199		
3	Current year loss	0		
	<b>Group III. Total</b>	37,141	-37,141	0
	<b>Section A Total (I+II+III)</b>	<b>137,141</b>		<b>138,659</b>
<b>B.</b>	<b>LONG-TERM LIABILITIES</b>			
<b>I.</b>	<b>Long-term liabilities</b>			
1	Payables to related parties			
2	Payables to received bank loans			
3	Payables to financial leasing			
4	Payables to leasing contracts	92,554	0	92,554
5	Payables to bond loans			
6	Deferred taxes			
7	Other long-term payables			
	<b>Group I. Total</b>	92,554	0	92,554

COMPANY VALUATION: CW ENERJI LTD.

<b>II</b>	<b>Deferred income and funding</b>			
	<b>Group II. Total</b>	0	0	0
	<b>Section B Total ( I + II )</b>	92,554	0	92,554
<b>C.</b>	<b>SHORT-TERM LIABILITIES</b>			
<b>I</b>	<b>Short-term liabilities</b>			
<b>1</b>	<b>Payables to related parties and shareholders</b>			
<b>2</b>	<b>Payables to received short-term bank loans</b>	119,666	0	119,666
<b>3</b>	<b>Payables to suppliers</b>	77,757	0	77,757
<b>4</b>	<b>Payables to leasing contracts</b>			
<b>5</b>	<b>Payables to employees</b>	14,149	0	14,149
<b>6</b>	<b>Payables to promissory notes</b>	235,302	0	235,302
<b>7</b>	<b>Fiscal payables and taxes</b>	14,455	0	14,455
<b>8</b>	<b>Payables to social security</b>	7,216	0	7,216
<b>9</b>	<b>Other commercial (trade) payables</b>	226,554	0	226,554
<b>10</b>	<b>Advances received for client's orders</b>	1,333,128	0	1,333,128
	<b>Group I. Total</b>	2,028,227	0	2,028,227
<b>II</b>	<b>Deferred income and funding</b>	0	0	0
	<b>Group II. Total</b>	0	0	0
	<b>Section C Total (I+II)</b>	2,028,227	0	2,028,227
	<b>Total liabilities (A + B + C)</b>	2,257,922	1,518	2,259,440
<b>D</b>	<b>OFF BALANCE SHEET LIABILITIES</b>	0		0

## APPENDIX III. FAIR MARKET VALUE CALCULATION WITH DCF METHOD

Source data	2014	2015	2016	2017	2018
Revenue from company's operation	TRY 880,000	1,760,000	4,400,000	11,880,000	35,640,000
Expenses for company's operation	TRY 280,000	420,000	924,000	2,587,200	8,279,040
Interests on the long-term debt (8 % interest rate p.a.)	TRY 89,600	80,640	71,680	62,720	53,760
Taxes (20 % corporate tax)	TRY 102,080	251,872	680,864	1,846,016	5,461,440
<b>Financial benchmarks</b>					
Net earnings (profit) after interests and taxes	TRY 408,320	1,007,488	2,723,456	7,384,064	21,845,760
Depreciation	TRY 95,000	95,000	95,000	95,000	95,000
Investments (purchase of fixed tangible assets)	TRY 1,000,000	0			
Changes in working capital	TRY 500,000	0	0	0	0
<b>Net cash flow (NCF)</b>	<b>TRY 3,320</b>	<b>1,102,488</b>	<b>2,818,456</b>	<b>7,479,064</b>	<b>21,940,760</b>

Calculations under DCF method	2014	2015	2016	2017	2018
Discounted Factor of Present Value if $r = 10\%$	0.9091	0.8265	0.7513	0.6830	0.6209
Discounted NCF	TRY 3,018	911,151	2,117,534	5,108,276	13,623,457
1.Estimated value	TRY				21,763,440
2.Terminal value	TRY				286,092,590
<b>Present Value of CW Enerji Ltd.</b>	<b>TRY</b>				<b>307,856,000</b>

#### APPENDIX IV. VALUATION TEAM OF INEA CONSULTING LTD.

**Ilko Iliev (42)** is *Founder and Manager* of Inea Consulting Ltd. He is responsible for all management and project activities of the company at national and international level. Ilko has more than 15 years investment and business consulting experience in renewable energy, ecology, environmental protection, commercial real estates, etc. He has done numerous renewable energy project strategies, concepts, market reports and outlooks, business plans, company valuations, asset valuations and feasibility studies for local and international companies and municipalities in Romania, Bulgaria, Kazakhstan, Poland, Croatia and other countries. He is principal as well of Inea Consulting's e-store for renewable energy reports and analyses about emerging markets "Renewable Market Watch". Ilko is fully responsible for the authorship and regular publishing of over 35 different analyses of solar, wind, biomass and biogas markets of all CEE & SEE countries and all CIS countries. Besides the management of Inea Consulting Ltd, he is member of consulting committee of Prime Innovations Ltd, founding member of European Competent Forum – NGO, Member of Advisory Board of East European Energy Systems Plc, etc. Ilko Iliev holds B.Sc. in Construction Management at Varna University of Economics, Bulgaria having specialized in sustainable energy, ecology and business psychology.

**Mihail Mihaylov (35)** is *Investment Manager* of Inea Consulting Ltd. He manages investment and financial activities of the company. Mihail participates in the process of financial models preparation, business plans development, company valuations, renewable energy portfolio analyses, energy market development forecasts, electricity markets future development scenarios and risk assessments. He is responsible also for investments related documents, contracts management and exchange, public-private partnerships strategy and development, relations with public authorities and tenders participation, relations with external partners and subcontractors of the company. Before joining Inea Consulting, he was for 4 years head of energy and economic analysis department at Varchev Finance Investment Funds, and for 9 senior investment advisor of MDM Partners Investment Boutique Ltd. Mihail Mihailov holds M.Sc. in Management at Varna University of Economics, Bulgaria having specialized in financial analysis, risk analysis, portfolio analysis and project management.

**Ivailo Milchev (41)** is *Senior Financial Analyst* of Inea Consulting Ltd. Ivo is engaged with management and execution of finance and analytical tasks within the company. He is



responsible for financial analyses, company valuations, financial models preparation, renewable energy asset valuations, accounting record reviews, risk assessments and financial data processing, relations with external partners and subcontractors of the company. Before joining Inea Consulting, Ivo was for 5 years regional manager for North-East Bulgaria of Bulstrad Plc., for 2 years as development manager for North-East Bulgaria at Allianz Bulgaria Plc. and for 4 years as regional manager of Petrol Holding Plc. Ivailo Milchev holds M.Sc. in Finance at Academy of Economics, "D.A. Tsenov", Svishtov, Bulgaria, having specialized in financial analysis, financial and insurance products development, risk analysis, project management and EU funding programs.

**Zahari Barbov (31)** is *Senior Project Manager* at Inea Consulting Ltd. He is responsible for cross data processing from multiple information sources and execution of energy market forecasts, electricity markets development scenarios, building of development scenarios of renewable energy projects and companies. Zahari has necessary qualification for reporting to the management and to the clients according to FIDIC books. He is engaged also with development of new international projects and expanding of services delivered by Inea Consulting. Before joining of Inea Consulting Ltd., Zahari worked for 4 years as project manager in IT department of E.ON Energy AG and 3 years as project manager for KAN Renewable Energy Holding Bulgaria Ltd. Zahari Barbov holds M.Sc. in Communications Engineering from Technical University in Varna, Bulgaria, M.Sc. in Management from University of Economics in Varna and currently is making his PhD in Information Technologies from University of Economics in Varna, Bulgaria.

**Angel Petrov (27)** is *Research Analyst* at Inea Consulting Ltd. He is engaged with day to day research and marketing process in the company, risk analysis, trend analysis, observation of deal flow and overall M&A activity on main renewable energy markets and sourcing of information & networking. Angel is analyzing data from multiple sources of information and elaborates market development scenarios, power demand and supply forecasts, and forecasts about renewable energy sectors of CEE & SEE countries, CIS countries and other emerging markets. He participates in elaboration and publication process of Inea Consulting's renewable energy market reports and outlooks. Angel finished High School of Foreign Languages in Varna, Bulgaria and currently and holds B.Sc. at Hague University, Netherlands, with major in International Marketing & Business Administration.

**SAMOAN Reg. No. 66831 ARBN 604 543 777**

**PLEASE READ CAREFULLY ALL INSTRUCTIONS ON THE NEXT PAGE.**

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or such lesser number of CDIs which may be allocated to me/us by the Directors.

[illegible]

**Surname** (PLEASE PRINT)

[illegible]

Street Number

Street

[illegible]

Suburb/Town

State

Post code

Date of Birth													Gender			Race		

## Telephone number – Business hours

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**E-mail address**[illegible]

Drawer

Bank

BSB

Amount of cheque

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**By lodging this Application Form:**

I/We declare that all details and statements made by me/us are complete and accurate;

I/We agree to be bound by the terms and conditions set out in the Information Memorandum and by the Constitution of the Company;

I/we acknowledge that the Company will send me/us a paper copy of the Information Memorandum free of charge if I/we request so during the currency of Offer;

I/We authorise the Company to complete and execute any documentation necessary to effect the issue of CDIS to me/us; and

I/We acknowledge that returning the Application Form with the application monies will constitute my/our offer to subscribe for CDIS in ENERGY SOLUTIONS INTERNATIONAL Limited and that no notice of acceptance of the application will be provided.

THIS FORM MUST NOT BE HANDED TO ANY PERSON UNLESS IT IS ATTACHED TO OR ACCOMPANIED BY THE INFORMATION MEMORANDUM DATED 5 JUNE 2015.

## HOW TO COMPLETE THE APPLICATION FORM

Applications must be made on the Application Form attached to this Information Memorandum. Please complete all relevant parts of the Application Form using BLOCK LETTERS.

- A) Enter the NUMBER of CDIs you wish to apply for. The application must be for a minimum of 6,667 CDIs and thereafter in multiples of 3,334 CDIs.
- B) Enter the TOTAL AMOUNT of application money payable. To calculate the amount, multiply the number of CDIs applied for by US\$0.30.
- C) Enter the FULL NAME(S) of all legal entities that are to be recorded as the registered holder(s). Use correct forms of registered name (see below). Applications using the wrong form of name may be rejected.
- D) Enter the POSTAL ADDRESS for all communications from the Company. Only one address can be recorded.
- E) Enter a CONTACT NAME and TELEPHONE NUMBER(S) of a person the Share registry can speak to regarding any queries they may have on the Application.
- F) Enter the details of cheque(s) accompanying the Application Form in payment of application monies.

## DECLARATION AND STATEMENTS

Before completing the Application Form the Applicant(s) should read the INFORMATION MEMORANDUM dated 5 June 2015. The Applicant(s) agree(s), upon and subject to the terms of the Offer, to take any number of CDIs equal to or less than the number of CDIs indicated on the Application Form that may be allotted to the Applicants pursuant to the Offer and declare(s) that all details of statements made are complete and accurate.

No notice of acceptance of the Application will be provided by the Company prior to the allotment of CDIs. Applicants agree to be bound upon acceptance by the Company of the Application.

If your Application Form is not completed correctly, it may still be treated as valid. The Company's decision as to whether to treat your Application as valid, and how to construe, amend or complete it shall be final.

There is no requirement to sign the Application Form.

## PAYMENT

Applications for CDIs must be accompanied by the application money of US\$0.30 per CDI (in Australian currency). Cheques should be made payable to "ENERGY SOLUTIONS INTERNATIONAL LIMITED".

## LODGING OF APPLICATIONS

Applications should be lodged at the address set out in section 6 of the Information Memorandum.