

PV Power Plants - Turkey – Abstract Submission - Applicable Topics: Self Consumption, Energy Storage, Project Planning & Plant Operation, Industry Scale Self-Consumption Projects in Turkey

Analysis and Comparison of Industrial Self Consumption Projects Planning, Development and Operation Practices – International vs. Turkish Market

Candan Ergeneman^{1*}, Daniel Gudopp^{2**}

¹*Environmental Engineer, B.Sc., MBA, Business Development & Project Manager, DEEA Solutions GmbH, Frankfurt am Main, Germany*

²*Dipl. Economist, Managing Director, DEEA Solutions GmbH, Frankfurt am Main, Germany*

** Corresponding author. Tel: 069 -13 39 78 67 / Fax: 069 – 34 87 99 969,*

Adress: Goetheplatz 4, 60311, Frankfurt am Main / GERMANY,

E-mail: c.ergeneman@deaa-solutions.com

***E-Mail: d.gudopp@deaa-solutions.com*

Abstract: Turkey is moving slowly but surely towards realizing photovoltaic socket grid parity: massive increase in electricity prices of 11 % for commercial consumers and 15% for private households over the last three years can be leveraged with photovoltaic system installations, thanks to country wide annual average solar irradiation of 1,527 kWh per square meter, significant decrease of module prices, and the recent regulatory incentives given. Therefore, Photovoltaic market in Turkey is expected to develop in a much different manner compared to other markets in the world, impacted notably by the FIT offerings, PV installations will be used directly to serve the end consumer for producing clean and economical electricity rather than safe financial products. A good business opportunity for supplying high and continuous industrial loads hence increasing operational efficiency and profitability with diesel-hybrid photovoltaic applications are rising as a solution against steadily increasing fuel costs and high electricity expenditures which have increased an average of 11 % a year since 2006.

This paper starts with a brief analysis of current and historical worldwide trends of photovoltaic self-consumption applications from technical, operational, regulatory, policy and financial point of views, debating pros and cons; and as a result pointing out the best practices. Technical solutions for decentralized electricity generation, self-consumption and application of smart grids are analyzed for feasibility in the Turkish market and compared with sample international projects. As a result of this qualitative assessment, recommendations for an ideal business plan and competitive strategies to overcome the already existing barriers for implementation of solar PV systems in Turkey are presented. The research is based on desktop and on site research, workshops performed with key stakeholders from governments, international donors, private investors and technology providers. Opinions are discussed regarding the financial perspectives: payback time for PV self-consumption investments are analyzed as a function of fuel prices, and with a fixed fuel price, overall saving potential for the hybrid plant owners can be analyzed based on DCF simulations. By conducting nationwide grid parity analysis the market potential for on-grid residential PV electricity for Turkey is estimated and this volume is translated into cumulated installed PV capacity potential (with and without storage solutions) by assumptions on weighted average annual irradiation on fixed optimally tilted PV systems, performance ratios, residential PV self-supply fraction and market penetration ratio.