

PHOTON ENERGY NV

NPV^{max} Energy Solutions

Strategy Review

MATERIAL	210
THINFILM	
INSPECTION	1000
TOLERANCE NORM ISO 8015:	TSO
PRECISION ISO:	YES
CONCEPT	
DESIGN	
NORM. REF.	
EXAMINED	
APPROVED	
NAME	
TYPE	

INDEX	X
	X
	X
	X
	X
AMEND.	

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Introduction

- ▶ The phase-out of support schemes of PV, retroactive measures against investors and the advent of the Solar Age with competitive solar energy have turned the industry heads-down
- ▶ PV plants are no longer subsidized financial assets but are built to help cover the energy needs of final users
- ▶ Final energy users require complete energy solutions, whose implementation starts with the capture of energy savings, followed by the maximization of on-site produced energy
- ▶ PV has become a globally competitive energy form
- ▶ The time is ripe for a fundamental review and re-think of our strategy in order to position Photon Energy as the leading **EXPERTS FOR THE SOLAR AGE** globally
- ▶ We are committed to making clean & safe energy affordable and accessible for everyone



AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Photon Energy Today

- ▶ Within 3 years of formation in 2008 Photon Energy grew from start-up to a EUR 100 million sales and balance sheet company on the back of the PV boom in the Czech Republic and Slovakia (Photon Energy 1.0).
- ▶ Photon Energy successfully applied an integrated downstream business model from project development to EPC services, project financing and equity investment all the way to long-term operations & maintenance.
- ▶ The Company was fully hit by the retroactive 26% solar levy on its 15 MWp portfolio of PV plants in the Czech Republic, followed by major discontinuities in its other EU target markets Slovakia, Italy and Germany.
- ▶ Photon Energy's bet on Independent Power Production through its 26 MWp portfolio of regulated PV plants provided stability during the PV industry crisis in the EU from 2011 to 2013 (Photon Energy 2.0).
- ▶ With a track record of 50 MWp of grid-connected PV plants across 5 countries Photon Energy is one of the top 20 global PV companies and among the leading public downstream PV companies in the world.
- ▶ Photon Energy's expansion to Australia in 2011 is starting to pay off as the market develops strongly.
- ▶ As a public company Photon Energy is transparent with stable & experienced management.
- ▶ With the phase out of PV subsidies the Company adapts its strategy for the Solar Age – Photon Energy 3.0.

» **TRIED & TESTED AND HUNGRY FOR THE SOLAR AGE**

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Key Trends in the PV Industry & Beyond

- ▶ PV is a robust technology using the largest (and endless) energy source available to mankind at an ever more competitive cost.
- ▶ PV is breaking down traditional hub & spoke grid-based energy supply systems – leading to major clashes in the developed world while allowing developing countries to leapfrog directly to distributed energy production & supply.
- ▶ Subsidized regulated PV assets in the EU have been harmed by retroactive measures in Spain, the Czech Republic, Greece and Bulgaria with more to come across the EU. Investment protection is becoming the no. 1 concern for the financing of PV assets in the EU and globally.
- ▶ The Solar Age is upon us where PV plants are no longer subsidized financial assets but are built to help cover the energy needs of final users.
- ▶ Final energy users require complete energy solutions, whose implementation starts with the capture of energy savings, followed by the maximization of on-site produced energy.
- ▶ The global PV industry has to date been too focused on the construction of PV plants without due attention given to the optimization of plant life cycle performance.
- ▶ The single most severe bottle neck for the proliferation of PV globally is financing. Project financing needs to be replaced by standardized financing solutions in a world without subsidies. A new frontier for applied finance.

» **THE SOLAR AGE IS FULL OF CHALLENGES AND OPPORTUNITIES**

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Key Opportunities for Photon Energy (1)

- ▶ Photon Energy's experience over the past 6 years provided several valuable lessons:
 - ▶ “What the government gives, it can and will take away, and then some” hence Rule no. 1: “Do not bet on any support schemes for PV electricity”
 - ▶ Rule no. 2: “Geographic diversification as well as along the value chain is a must”
 - ▶ Rule no. 3: “An integrated business model is sensible, but sustainable shareholder value is only created by activities generating recurring revenue streams”
- ▶ Any business can only hope to be profitable in the long-term if it provides its customers superior value more effectively than its competitors. The areas where Photon Energy is well positioned to do exactly that are:
 - ▶ Injecting a disciplined comprehensive approach to the life cycle of PV plants from development, design & construction all the way to O&M, where the ever growing experience from the O&M on an expanding portfolio is constantly fed back into the next generation of PV plants. O&M is also the most suitable part of the value chain to reduce and absorb the technical and performance risk of PV plants over their life cycle, thus enabling more standardized financing solutions.



HARD LESSONS = INVALUABLE EXPERIENCE FOR THE FUTURE

PHOTON ENERGY STRATEGY REVIEW

Key Opportunities for Photon Energy (2)

- ▶ Retroactive regulatory and tax measures against investors in PV assets will continue in the EU and will be copied by governments globally. Ignoring this risk even in the most stable jurisdictions would be outright negligent. Therefore, investors in renewable energy assets must put the best available legal structures protecting their investments in place, cooperate on legal defences with other investors and be prepared for potentially drawn-out battles with delinquent states. Photon Energy's direct (and painful) experience can be leveraged globally.
- ▶ Energy production is decentralizing away from the electricity grid on the back of the distributed properties of PV and other decentralized generators. The future lies in Building-integrated PV (BIPV), Infrastructure-integrated PV (IIPV), near-site PV plants (ground-mounted near large energy users) and off-grid installations. The final energy users require a comprehensive solution covering 100% of their energy needs reliably. On-site generated electricity from a PV system must not reduce reliability of supply while bringing long-term cost savings on top of its positive environmental impact. Only sophisticated energy solutions and world-class O&M ensures meeting all these requirements.
- ▶ The Solar Age without support schemes makes financing PV plants more difficult than before. To date many financing solutions used in other industries have not yet been applied to PV, hence the innovation potential for standardized solutions is substantial. The key to their successful implementation will be world-class O&M.



EVERYTHING REVOLVES AROUND OPERATIONS & MAINTENANCE

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

The NPV^{max} Concept

- ▶ PV uses the largest (and endless) energy source available to mankind for free (until it will get taxed). Over 90% of the levelized cost of energy (LCOE) from a PV system is linked to the amortization of the investment cost and the cost of the capital employed. Operations, maintenance, insurance and other operating costs are typically minor items.
- ▶ Despite the continuing decline in investment cost per unit of installed capacity, the necessary proliferation of PV for solar energy to become the prime energy source will require the deployment of vast amounts of capital globally over the next few decades.
- ▶ Competently deployed capital always seeks the highest possible return given a certain level of risk. Once equity and debt providers will have become comfortable with all external risk factors related to a PV plant in a given country and its energy sales concept, the realized return from their investment will be a function of the performance of the PV plant.
- ▶ Long-term investment projects like PV plants are typically evaluated on the basis of Discounted-Cash-Flow (DCF) models, where the expected future revenues, costs and cash flows to the debt and equity capital providers are modelled and then discounted to the present based on the real cost of the debt capital and the return expected by the equity capital investors. The sum of the present values of the cash flows in the future is referred to as the Present Value (PV) of the project.

PHOTON ENERGY STRATEGY REVIEW

The NPV^{max} Concept

- When deducting the investment cost from the PV we arrive at the Net Present Value (NPV) of the project. Projects with an NPV = 0 just about cover their cost of capital. Any positive NPV is also referred to as excess return (above the cost of capital) and accrues to the equity investors, who thus realize a return above the level expected/required by them. Needless to say, the higher the excess return the better, therefore investors are interested in maximizing NPV.
- Hence, all legal, technical and financial aspects of the development, construction and operation & maintenance of a PV plant serves one single purpose: the maximization of the PV plant's NPV, which we express as NPV^{max}. Of course, the same concept applies to energy savings, supply and management projects and installations.
- NPV is calculated when a project is planned. NPV^{max} requires the highest possible cash flows to be effectively delivered throughout the lifetime of the project.
- In order to achieve NPV^{max} the optimal balance between investment costs (design, component quality, workmanship quality, etc.) and operations & maintenance (preventive measures, uptime, response times, etc.) and the resulting plant performance must be struck. The tradeoffs between these many variables are virtually endless and reaching optimum requires a combination of expertise, experience and dedicated service.
- Achieving NPV^{max} requires an uncompromising plant life cycle approach combined with an ongoing transfer of O&M experience into the design, engineering and construction of new PV plants.

» NPV^{max} IS 1 + 1 = MORE THAN 2

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Future Business Lines

	Photon Energy Operations	Photon Energy Solutions	Photon Energy Generation	Photon Energy Finance	Photon Energy Investments
Key activities	Advisory (Feasibility, Design, EPC supervision), Plant & Warranty Audits & Recovery, Performance Enhancement, Operations & Maintenance & Insurance	Energy Savings Advisory & Solutions, Energy Supply Solutions, Energy Management Solutions & Operations	Supply of PV-generated electricity to final users based on commercial PPAs mainly in BIPV, IIPV, local grid and off-grid settings	Standardized Financing Solutions for PV plants and PV-centered Energy Solutions. Arranging Project Financing and Capital Markets based financing. M&A services for Renewable Energy Assets	Investment in and commercial management of regulated PV portfolio and merchant PV assets. Asset management for external investors through Investment Holding companies and Fund structures.
Innovation for Photon Energy	Advisory, Plant & Warranty Audits & Recovery, Performance Enhancement	Focus on delivering complete solutions. Permitting, Project Development & EPC become support functions.	Investment in merchant PV assets with captive commercial customers.	Standardization of financing is the most crucial task for the entire industry.	Asset management for external investors leveraging experience & capabilities.

» NPV^{max} DRIVES EVERYTHING WE DO

PHOTON ENERGY STRATEGY REVIEW

Future Business Lines

	Photon Energy Operations	Photon Energy Solutions	Photon Energy Generation	Photon Energy Finance	Photon Energy Investments
Customer Value Proposition	A comprehensive approach to the life cycle of PV plants from development, design & construction all the way to O&M. Absorption of all technical risks of PV plants.	Energy users will be able to benefit from a clean, safe, reliable and affordable energy supply. Energy savings before implementation in combination with a lock-in of energy prices creates value.	Energy users unable to commit capital will be able to procure energy from Photon Energy and save immediately.	Only when financing a PV plant will be as simple as a mortgage or car leasing, will solar energy achieve its full potential. Photon Energy seeks to be among the global pioneers.	Photon Energy is an experienced owner & operator. Experience and know-how in relation to effective protection against retroactive measures has been gained. Strong rationale for aggregation of PV assets.
Photon Energy Shareholder Value Proposition	Operations & Maintenance generates stable multiple recurring revenue streams and enjoys a high operating leverage. It is the key to large-scale standardized financing.	Final energy users require complete energy solutions, whose implementation starts with the capture of energy savings, followed by the maximization of on-site produced energy. Standalone PV plants will be a hard sell.	Electricity sales to final energy users provides stable recurring cash flows. High quality design & construction as well as world-class O&M provides NPV ^{max} .	Standardized financing solutions are the holy grail of the industry. Photon Energy Operations provides the key competitive advantages against financial institutions by providing performance guarantees and maximizing recovery values.	Asset management for external investors will provide Photon Energy with economies of scale and recurring revenue streams.

» VALUE FOR ALL STAKEHOLDERS

AGENDA

Introduction

Photon Energy Today

Key Trends in the PV Industry & Beyond

Key Opportunities for Photon Energy

The NPV^{max} Concept

Future Business Lines

Next Steps

PHOTON ENERGY STRATEGY REVIEW

Next Steps

- ▶ Our current services & products will be realigned in order to best serve the five business lines
- ▶ The NPV^{max} Concept will be implemented into all services & products
- ▶ The Photon Energy Operations offering will be expanded by advisory and other new services
- ▶ A service offering for energy savings and management will be introduced in early 2014
- ▶ The Australian market will be focus for the expansion of PV generation capacity in 2014 and beyond
- ▶ The financial services team within Photon Energy will be expanded and standardized financing solutions are being developed
- ▶ An investment platform for the aggregation of PV assets in the EU under an optimally protected legal structure is being prepared as the Group's first step into asset management for external investors

» **THE SKY IS THE LIMIT**

PHOTON ENERGY STRATEGY REVIEW

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