Contribution of PV to EU 2020 targets … and beyond

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A. El Gammal
Secretary General

Context

1. EPIA
2. EC SET Plan and SET For 2020

European Photovoltaic Industry Association

The world's largest industry association devoted to the solar PV electricity market

- Represents **+ 200 members** constituting 95% of EU PV Industry
- Members represents the **whole PV value chain**
- **Influences key decision makers** at national, **EU** and global levels
- Is a key **information provider** about market, legislation scientific and technology developments
- Provides a unique **Information Platform (**website, Publications, Conferences) and **Networking Platform (**Conferences, Workshops and expert working groups)
- EPIA coordinates the **EUPV TP**

SET Plan and SET For 2020

The EC SET Plan

- EC Instrument to foster accelerated development & wide-scale application of low carbon technologies
- Solar Europe Industry Initiative (SEII)

- Led by industry
- Focus where barriers, scale of investment and risks can better be tackled collectively
- Deliver progress beyond business-as-usual
- Combine technology push and market pull: RDD&D

SET For 2020

- Triggered by EC SET Plan, EPIA Strategic initiative to demonstrate the true potential of PV as mainstream electricity technology

- Define clear target penetration: 12% PV by 2020
- Define Industry Roadmap to achieving 2020 target
- Implement PV Industry roadmap by establishing appropriate framework conditions

EUPV TP

Accelerate deployment of PV

SET For 2020

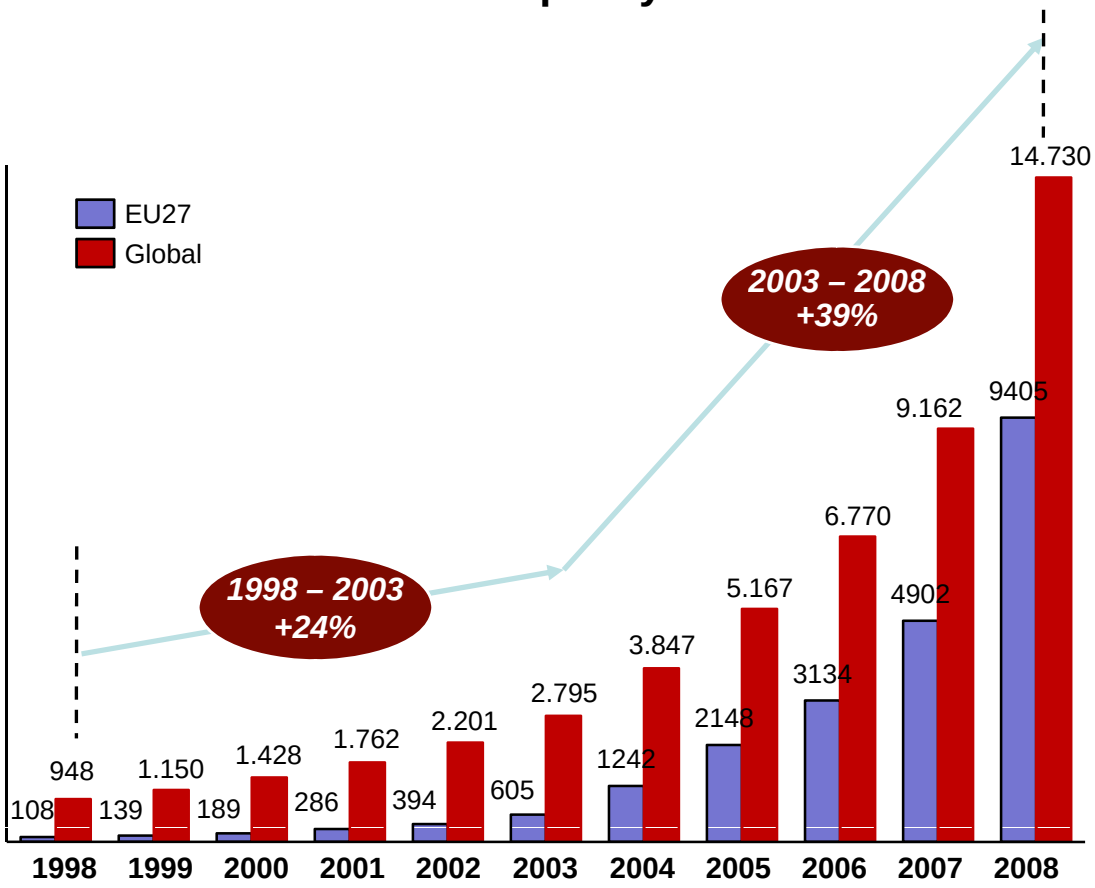
The Vision

SET For 2020

- **Study Launched in 11/2008**
  - Commissioned tby EPIA to consulting firm A.T. Kearney
  - EUPVTP integral part of the Steering Committee
  - Europe-wide study with focus on 10 key markets
  - 6 months, 100 interviews inc. industry, research institutes, policymakers , regulators, utilities.
  - « PV Industry » in the energy market
- **Findings, recommendations & roadmap fully endorsed by Industry**
- **Implementation Phase launched 05/2009**

PV has shown impressive growth in EU & globally, despite economic and administrative barriers

Cumulative installed PV capacity in EU27 and in the world

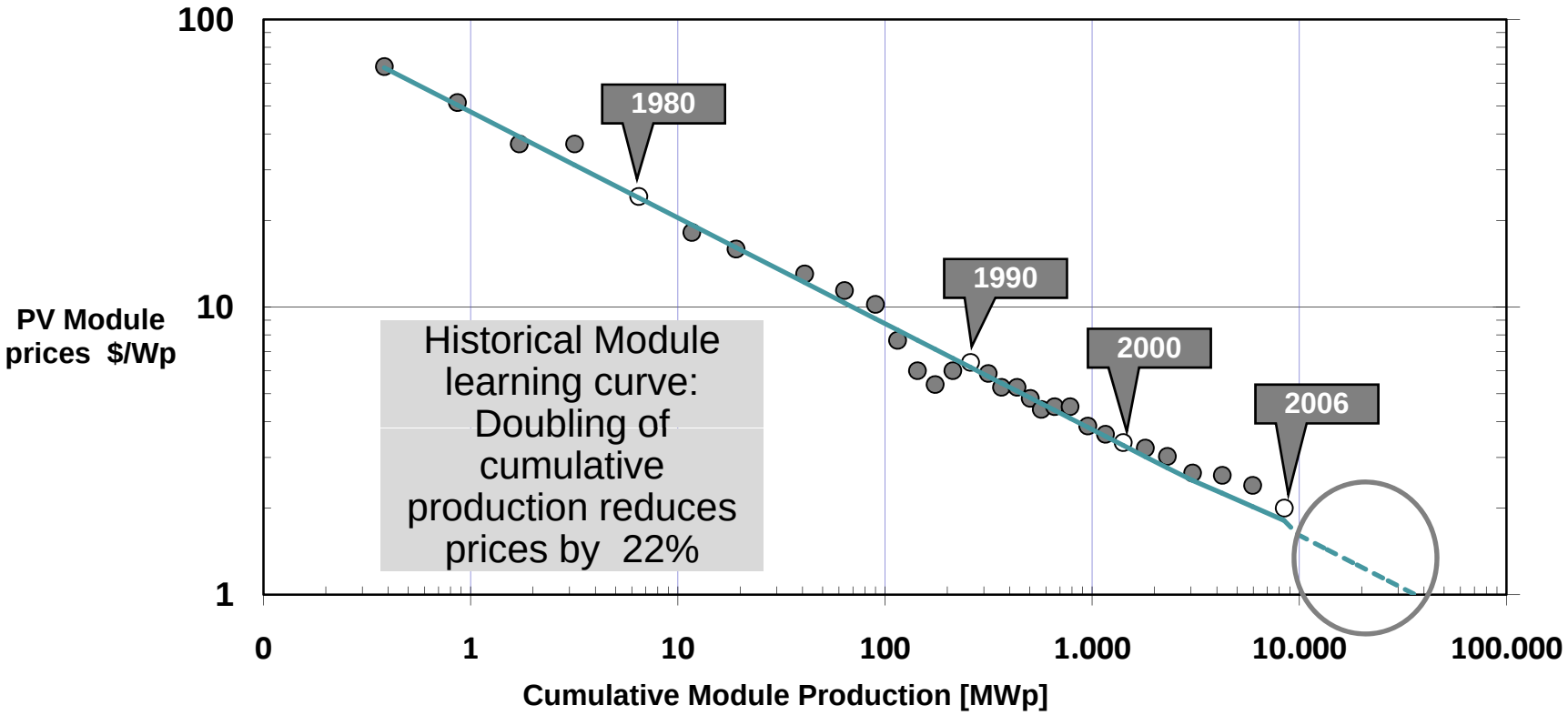


The main limitation to massive deployment still remains

COST

PV technology has demonstrated consistent ability to achieve fast price reductions…

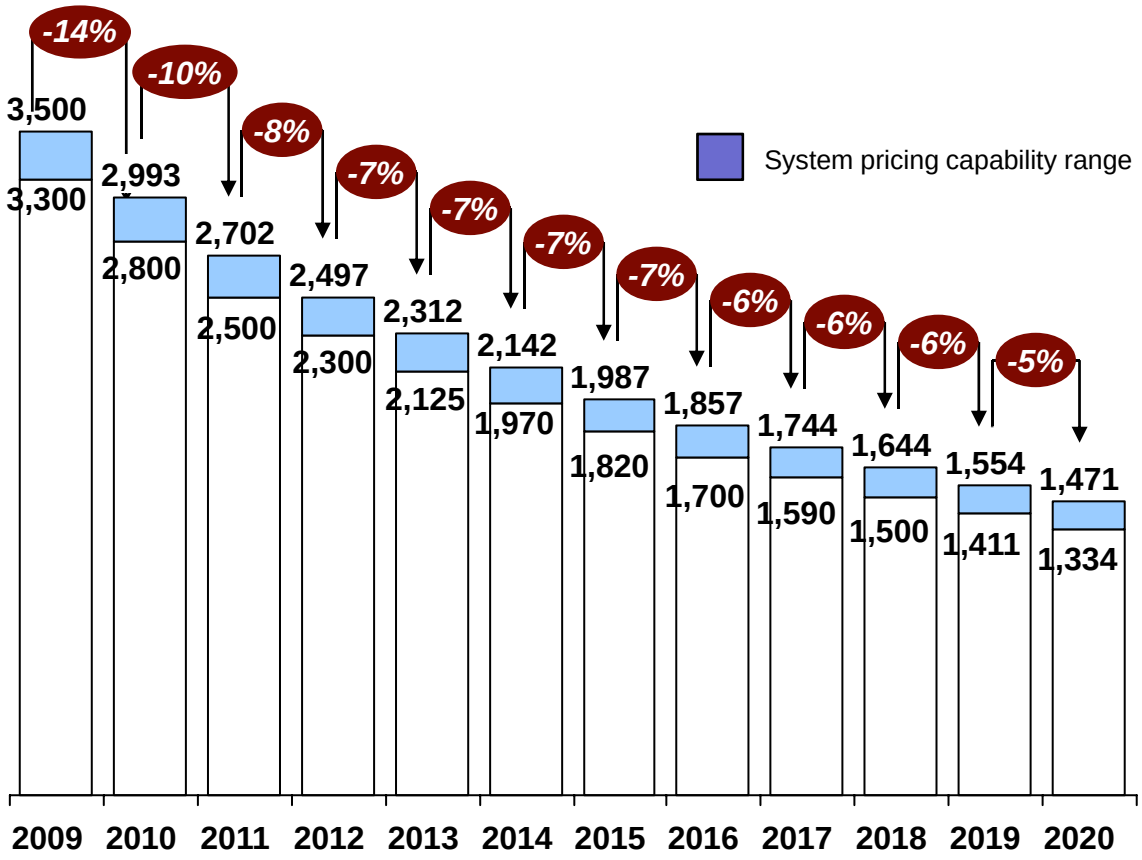
Photovoltaic module price learning curve since 1976 ($/W$_p$)



The industry must demonstrate that PV will continue its successful technological progress and become cost competitive

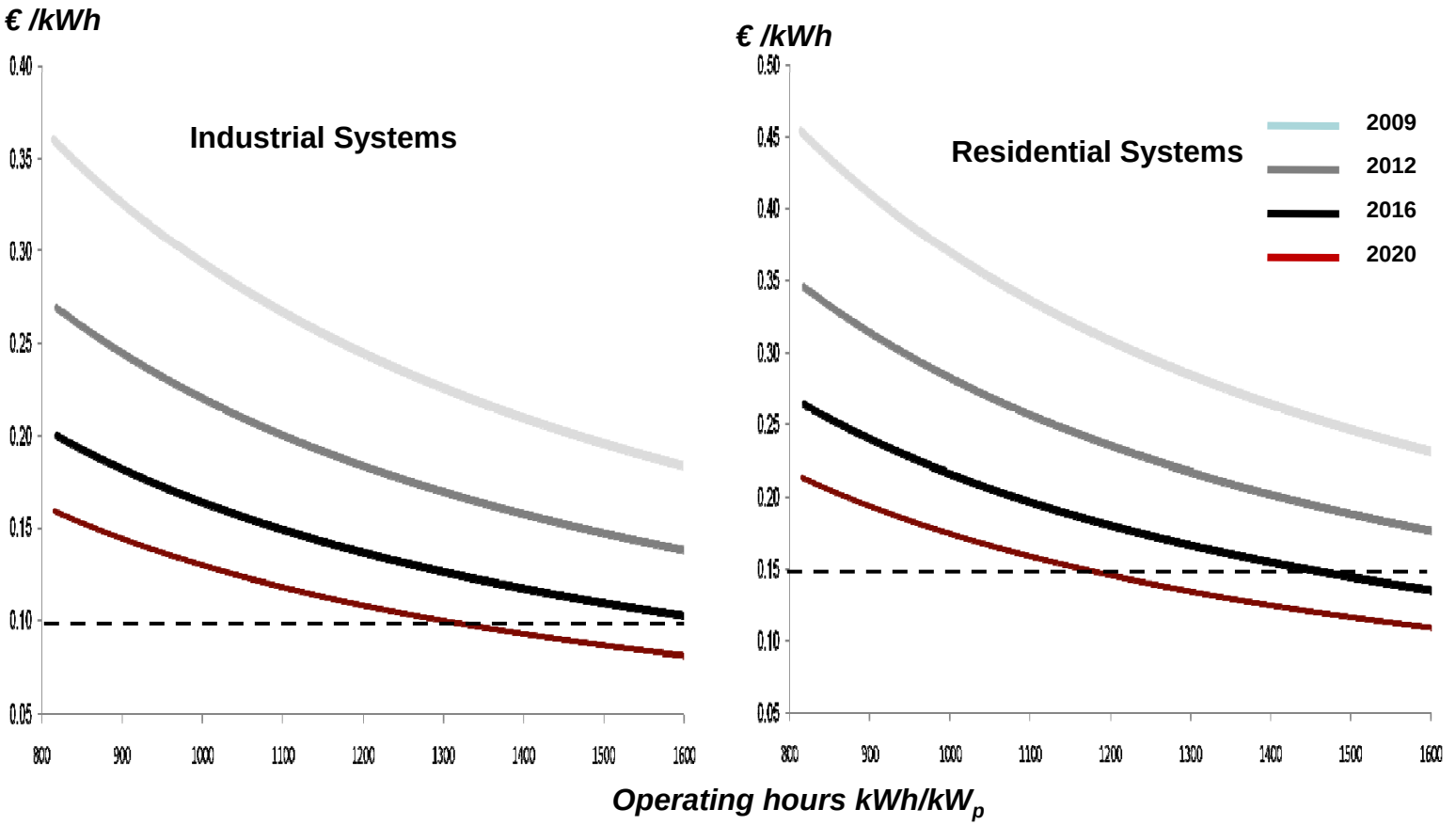
PV is exepcted to allow a 50% price reduction at a system level by 2020 with further future improvement potential

Pricing range for larger systems (€/Kwp) – "12% Scenario"



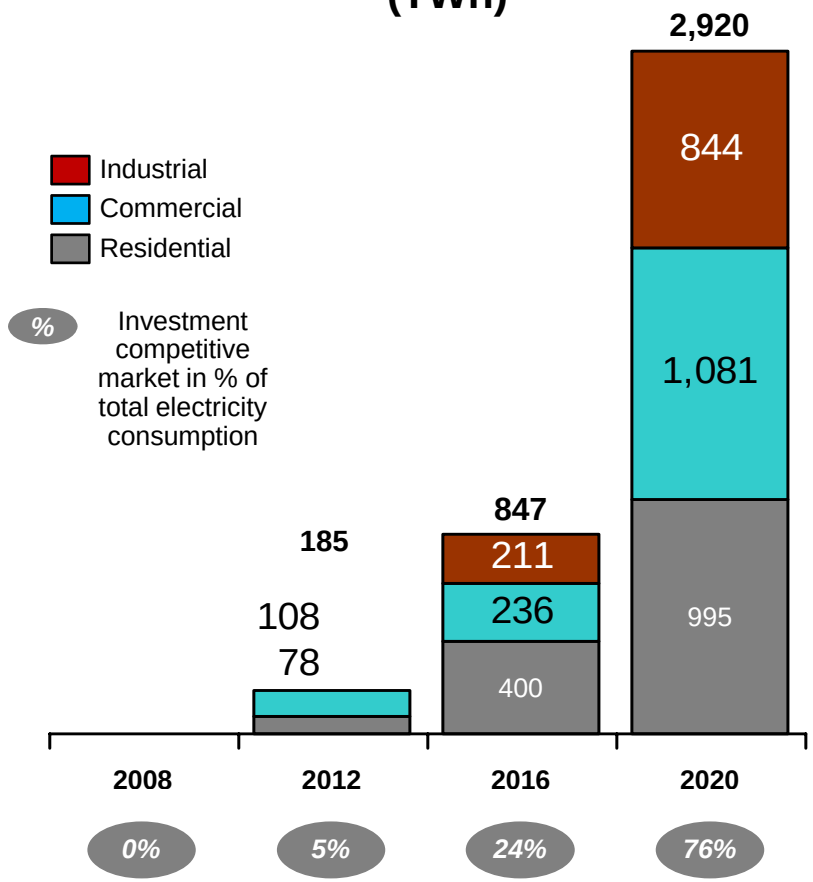
The PV industry is committed to reach a target cost of well below 10€c per kWh of PV generated electricity by 2020 for industrial systems…

Evolution of PV-levelised cost of energy "12% Scenario"



“Investment competiveness” will be achieved potentially reaching an addressable market representing 76% of EU electricity market by 2020

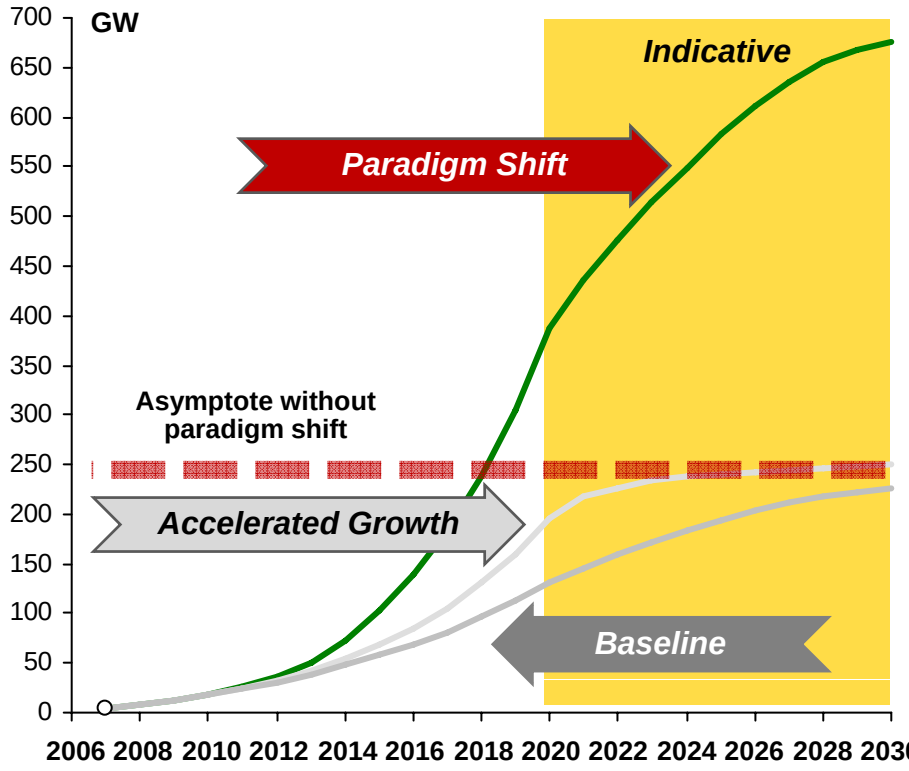
Evolution of the investment competitive market (TWh)



Comments

- An “investment competitive” market is defined as the sum of the electricity markets (by country and by segment) where investment competitiveness is achieved
- By definition, an investment competitive market represents an adressable potential market, and should not be confused with actual deployment
- The size of the accessible market is higher in the Paradigm Shift Scenario, as a quicker penetration of PV will enable a faster reduction of PV system prices

PV can contribute 12% of power generation by 2020 if a paradigm shift regarding electricity supply is achieved



Paradigm Shift Scenario:
- 12% of electricity demand by 2020

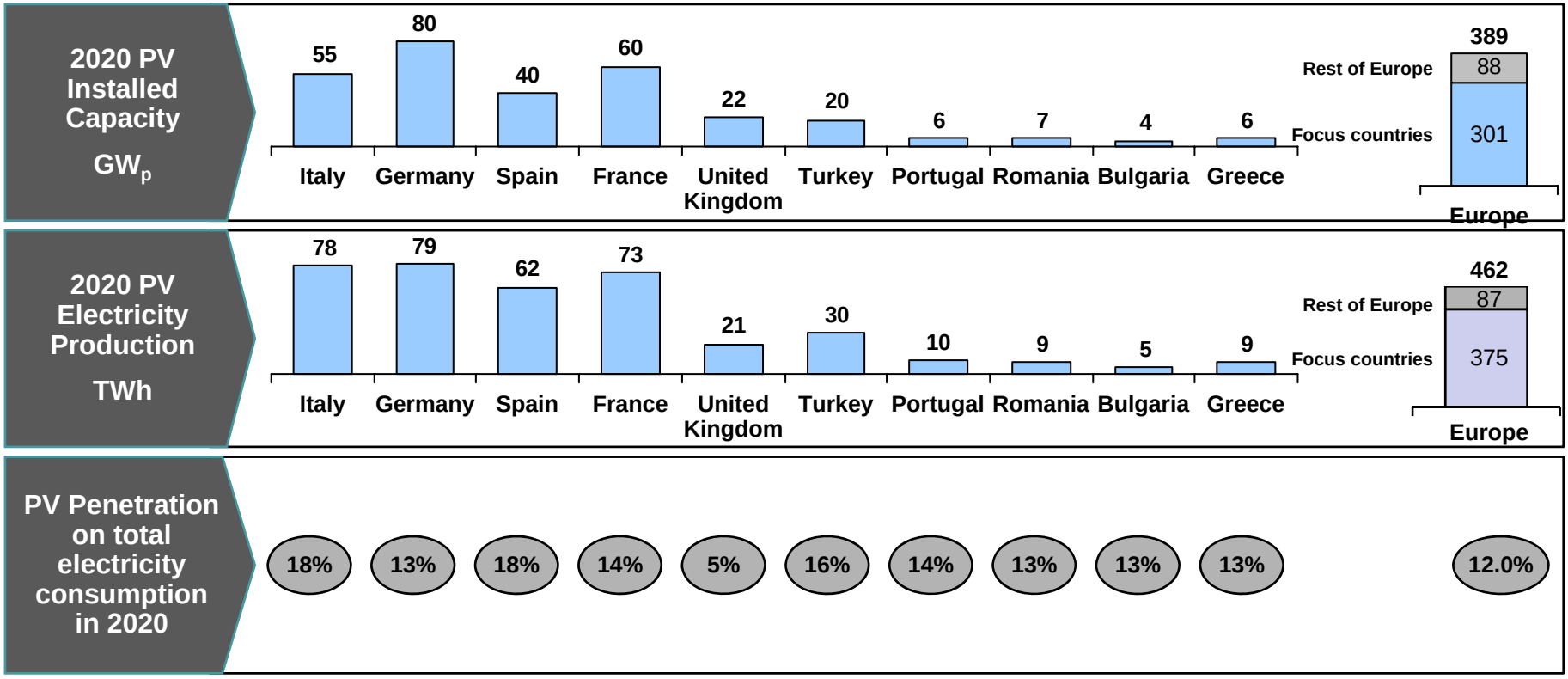
Accelerated Growth Scenario:
- 6% of electricity demand by 2020

Baseline Scenario:
- 4% of electricity demand by 2020

The Paradigm Shift requires significant changes in the existing electricity system and at market and regulatory levels, together with a strong collaboration with other players in the energy sector

Deployment will vary widely by geography

PV deployment by country in the Paradigm Shift Scenario

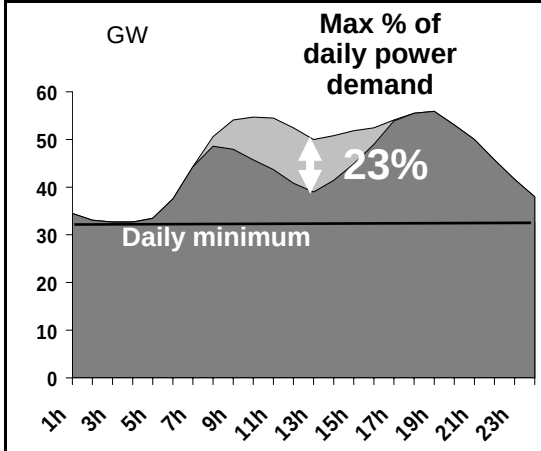


Deployment scenarios by country were determined by means of a PV-readiness index, evaluating all identified influencing factors for PV deployment

The daily and seasonal variations of PV generation are a challenge for PV penetration and require flexibility in the electrical system

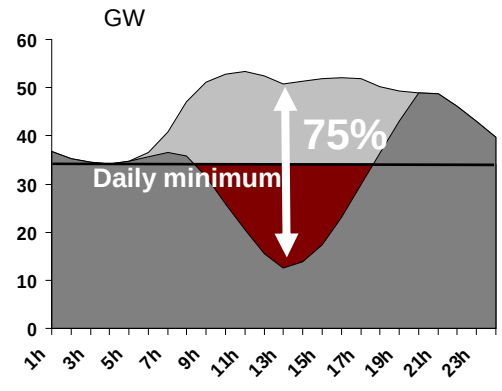
A theoretical example of a national average electricity demand daily profile and simulated PV production

Daily Demand on Average Winter Week Day



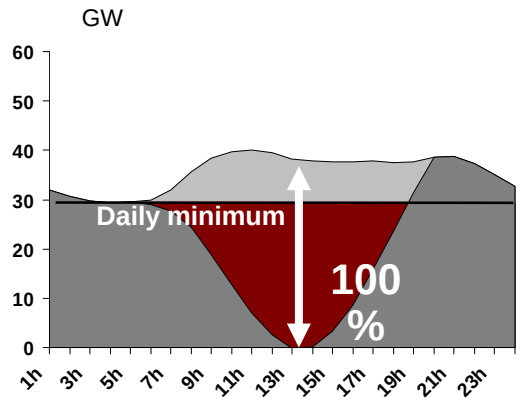
Daily energy demand covered by PV	7%

Daily Demand on Average on Summer Week Day



Daily energy demand covered by PV	27%

Daily Demand on Average Summer Week-end Day

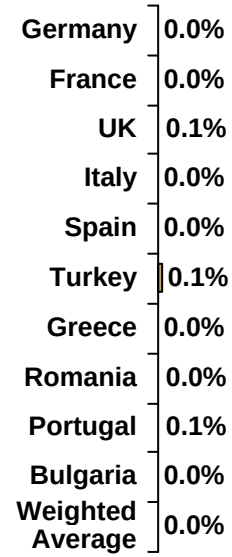


Daily energy demand covered by PV	38%

A penetration of more than 6% of PV electricity will require substantial evolution of the electrical system "Pradigm Shift"

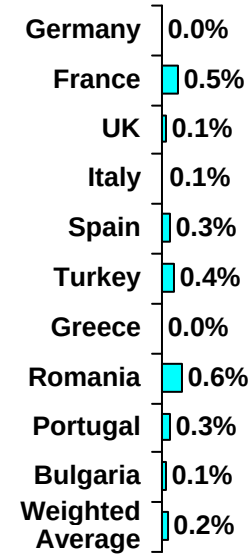
Average energy below daily minima for deployment scenarios

Baseline Scenario: 4% of the Electricity Demand



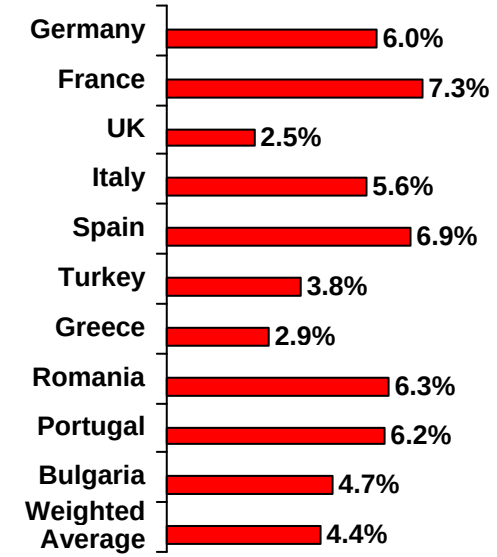
No PV energy below daily minimum

Accelerated Growth Scenario: 6% of the Electricity Demand



Very limited PV energy below daily minimum

Paradigm Shift Scenario: 12% of the Electricity Demand

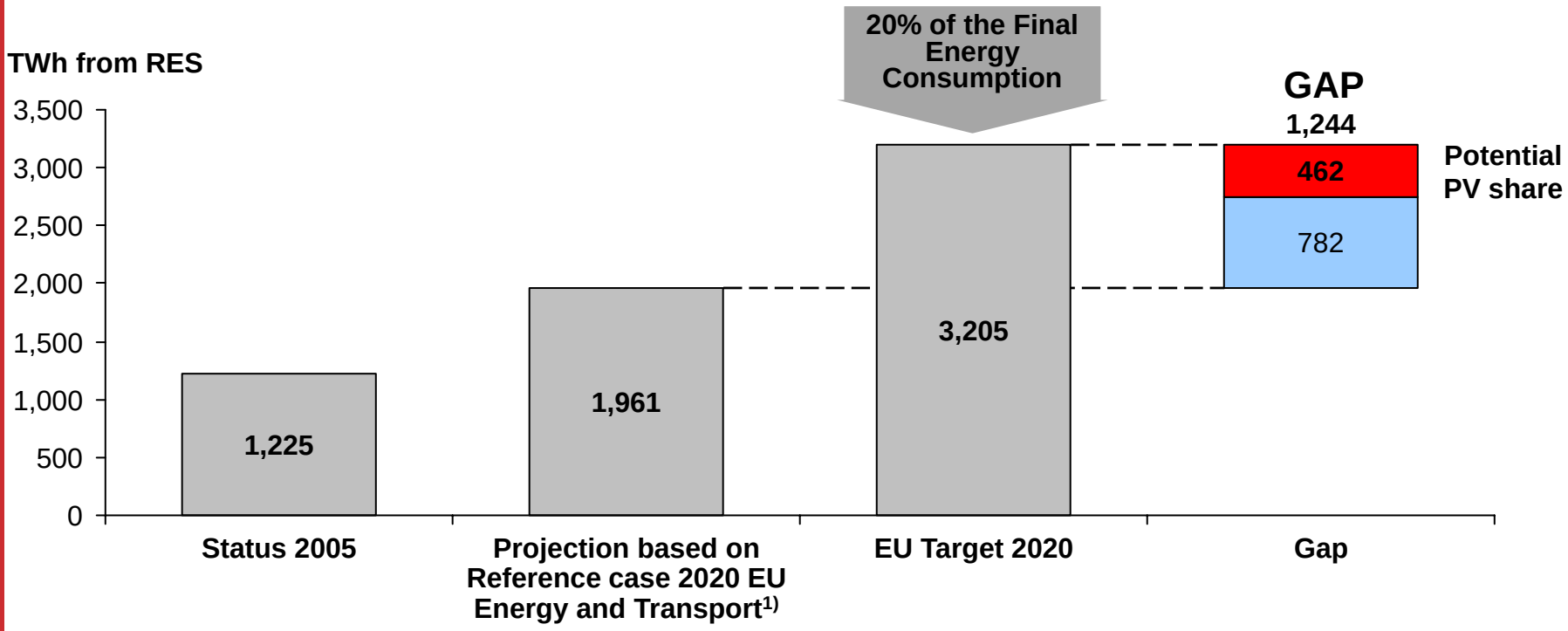


Significant PV energy below daily minimum

PV energy below current daily minima is very low for PV penetrations up to 6%. Therefore, the wasting of extra PV production will not impact the load factor excessively

Environmental and Sustainabity benefits: PV can make a very significant contribution to close the EU RES gap

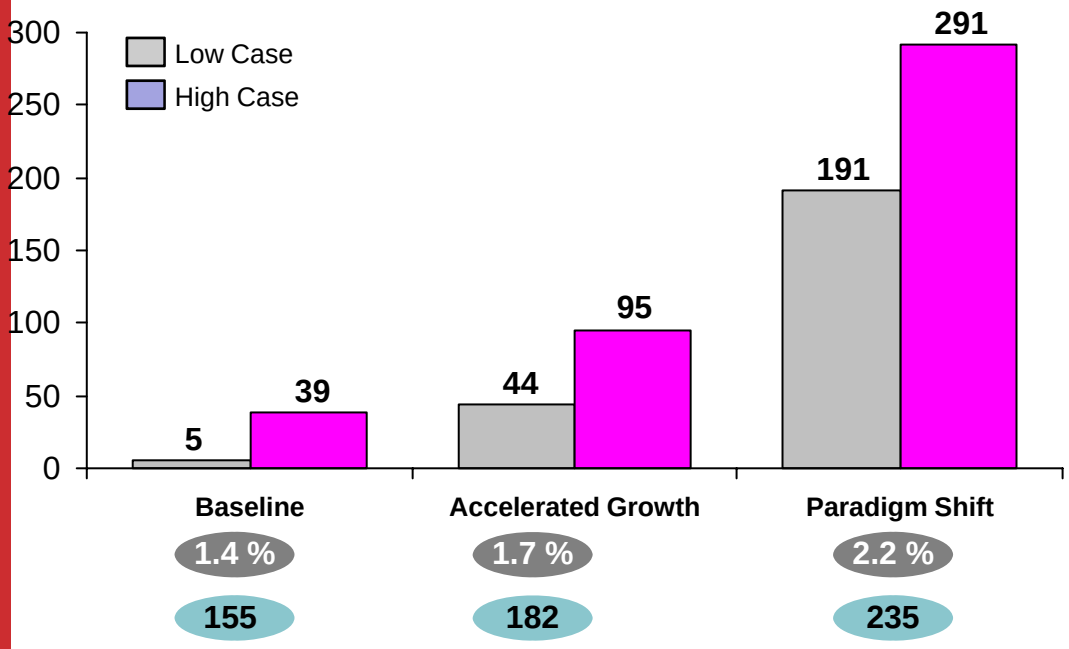
EU 27 policy target for Total Final Energy Consumption vs. likely RES – Scenario



Assuming target achievement of 12% by 2020, PV can cover about 35% of the projected RES gap

Macro-economic benefits to EU Society: FiT (and other support) for PV is rewarded with a positive return, providing net benefits of 200 - 300 bn € to Europe (12% scenario)

Net present benefit from PV deployment (€ Bn)



% Average percentage of the present value of FiT investment needed as share of total electricity prices in Europe during the feed in period

€ Bn FiT investment needed in absolute values

Key Factors

- **FITs**
- **CO2 avoidance**
- **Hedging value (volatility of fuel prices)**
- **Grid losses**
- **Operiting reserve**
- **Utilities margin**

Executive Summary

- By 2020 PV can reach competitiveness for up to 75% of the EU electricity market and supply up to 12% of EU electricity demand with technology that is already available today.

- However, such a penetration will require significant changes in the electrical system to absorb the intermittent and distributed nature of PV: Flexible generation portfolio, Smart grids, distributed storage, virtual power plants, electric mobility : "Paradigm Shift"

- Policy and industry need to work together to make this market accessible by creating an adequate support and regulatory environment but also by fostering technological progress, innovation and cost reduction – the SET plan (SEII) and the EUPV TP provide an instrument and platform to ensure this
- Promoting PV has a Strong Societal Value
  - Global Climate Change
  - Energy Competitiveness
  - Energy Security of Supply

- Promoting PV is an INVESTMENT – Not A Cost – providing huge Net Positive Financial Return for Society The more ambitious the deployment, the more profitable to EU Society.

SET For 2020
Implementing the Vision

Set For 2020 – Agenda

- **Study Phase completed (Phase 1)**

- **Report Official EU Launch Monday 22 June 2009**
  - Executive Summary : free downloadable www.setfor2020.eu
  - Full report (text + slides) : for purchase

- **Implementation Phase Launch (Phase 2)**

Implementation Phase

SET For 2020 identified 75 recommendations required to achieve the 12% vision

21 Recommendations have been selected as High Priority actions

Short Term Actions

Short Term Impact

→ Market **continuity**

Availability of **finance**

Short Term Actions

Mid Term Impact

→ Growth **sustainability**

Achieve **paradigm shift**

Example 1 – Policy & Market : « PV Obervatory »

Country assessment details (Q4 2008)

		IT	ES	DE	PT	FR	GR	TR[3]	RO	BG	UK
Appropriateness of PV Support	FINANCIAL SUPPORT SYSTEMS										
	Feed-in Tariff										
	Investment Grants										
	Beneficial Credit Terms										
	Tax Credits										
	Quota/TGC										
	Net metering										
	Existence of Cap										
	LEVEL OF FIN. SUPPORT AVAILABLE (IRR)[1][2]										
	Residential System	9-14%	7-12%	6-8%	7-9%	3-8%	10-13%	4-5%	-5- -3%	11-12%	1-2%
	Commercial BAPV	8-13%	8-12%	6-8%	5-5%	4-9%	14-17%	5-6%	-4 - -2%	9-10%	<-5%
	Commercial BIPV	9-15%	4-11%	6-8%	5-5%	9-16%	14-17%	5-6%	-4 - -2%	9-10%	<-5%
	Industrial – Rooftop	9-15%	9-14%	7-9%	3-4%	5-11%	14-17%	6-7%	6-7%	10-12%	<-4%
	Industrial – Ground-mounted	9-14%	10-15%	5-7%	-2-0%	6-12%	15-18%	7-9%	7-8%	11-13%	-5- -4%
Ease of Installation Procedures	ADMINISTRATIVE COMPLEXITY										
	Authorization Procedures										
	Administrative Lead Time										
	GRID CONNECTION COMPLEXITY										
	Grid Connection Cost Division	all costs by prod	shared	shared	all costs	shared	all costs	all costs	all costs	shared	shared
	Grid Connection Lead Time (months)	1-6	1-6	<1	<1	6-12	1-6	6-12	1-6	1-6	< 1
Industry Significance and Influence											
	Significance of Industry Base										
	Strength of National Association										

Example 2 : RDD & D: "SEII Implementation Plan"

- "**Creating an Energy Revolution through Accelerated Evolution" and moving beyond a business-as-usual scenario.**

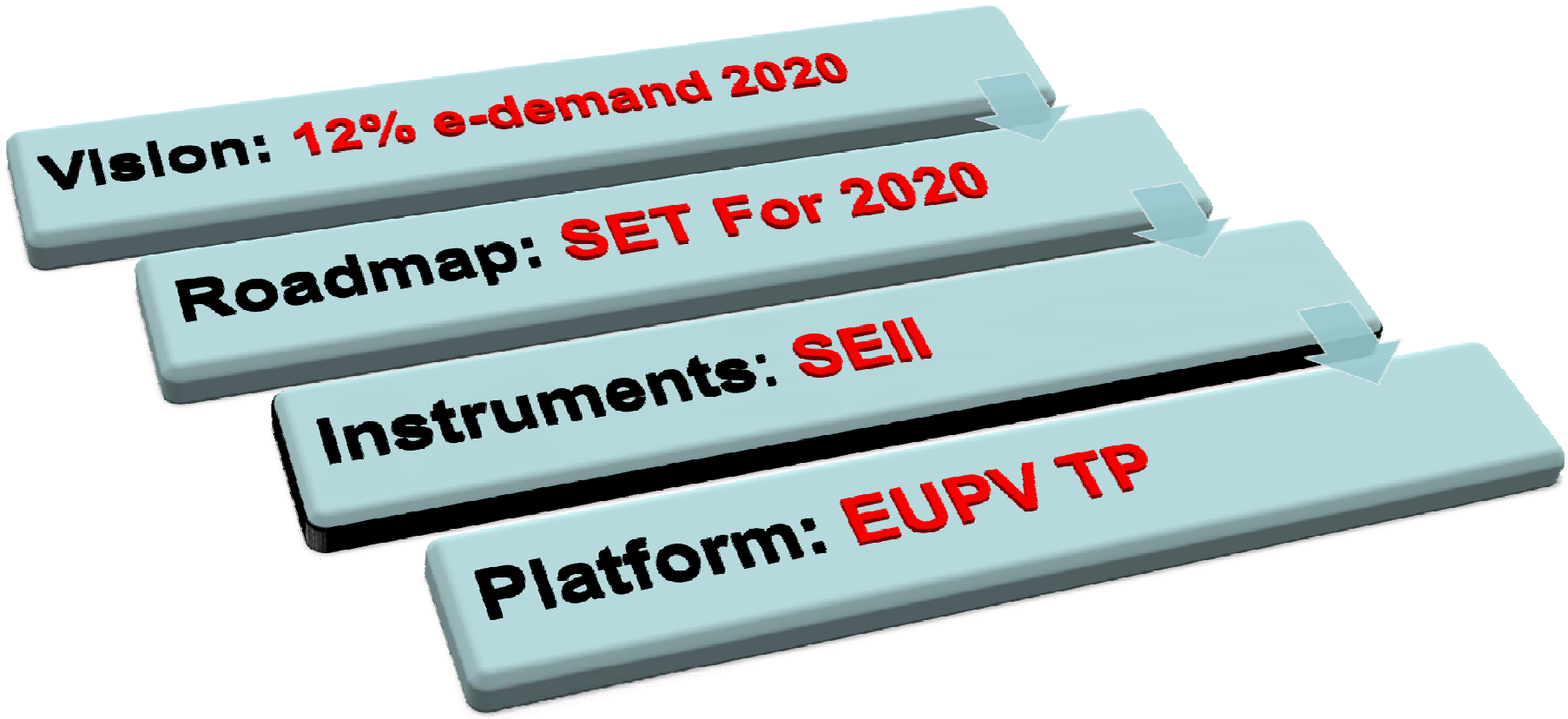
- **3 major initiatives (29 sub-initiatives)**:

  SEII 1: Cost Reduction

  SEII 2: System integration in the EU electrical system

  SEII 3: Demonstration and Deployment (including awareness & education)

The EUPVTP is the ideal platform for the Industry to reach out to the wider stakeholder context



The Course Of the Solar Age is Being Set Today

www.setfor2020.eu

www.epia.org