**Corporate Presentation** 

Welcome to the world of Encavis!

September 2018

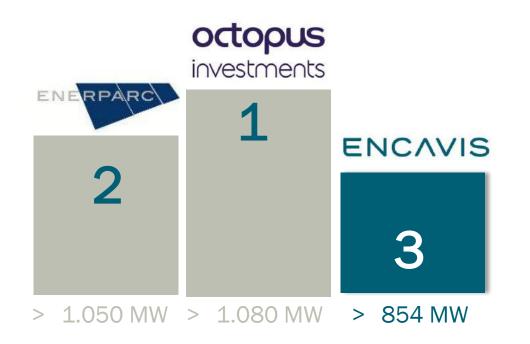
# We are a leading independent power producer from renewable energy sources in Europe.

Our generation capacity of solar and wind parks sums up to > 1.5 GW – and growing. We are listed on the German stock exchange and member of the SDAX Index.



TOP 70 EUROPEAN SOLAR PV PORTFOLIO OWNERS 2018\*

Encavis #3 among the top 70 European solar PV portfolio owners



COMPELLING REASONS TO INVEST IN ENCAVIS ...

### > Leading independent European IPP in the renewable sector

- > Generation capacity of > 1.5 GW
- > Market capitalization > 800 mEUR
- > Equity ratio of ~27% (06/30/2018)

### > Valuable portfolio, low-risk substance and low-risk profile

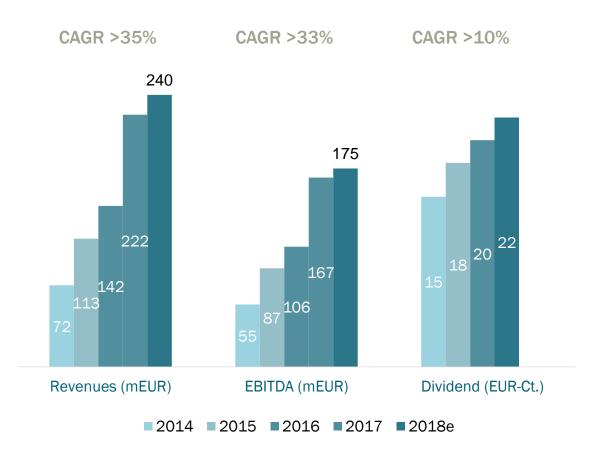
- > 171 PV/65 wind parks with long-term Feed-in-tariffs/PPAs> Attractive non-recourse financing conditions on project level
- > Ready-to-build/turn-key projects and parks in operation

### > Long-term, attractive dividend policy

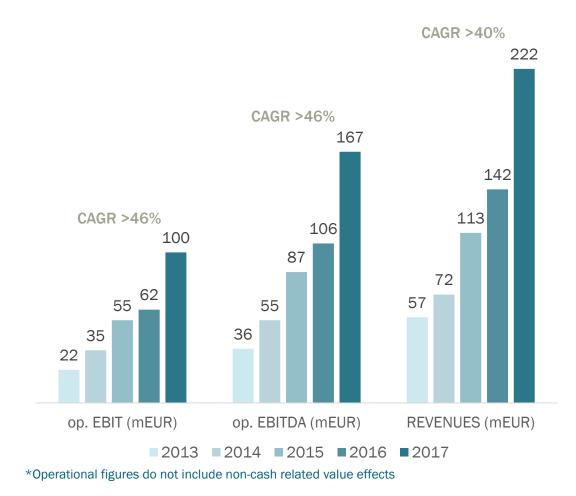
- > Nominal dividend to increase by 50% until 2021
- > Dividend offered as scrip dividend

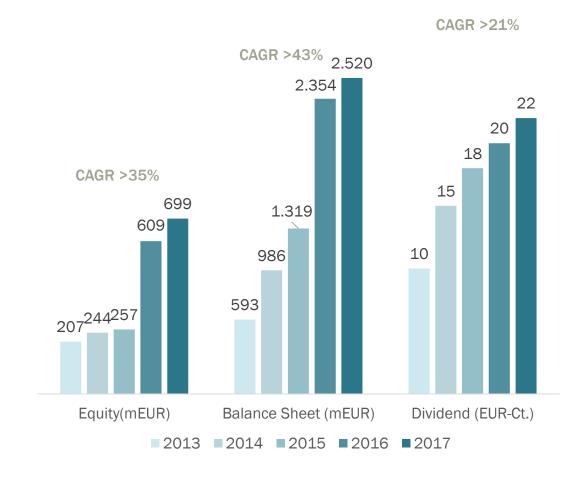
### > Forward-looking sustainable investment in a dynamic market

- > Strategic alliances with top project developers
- > Fast growing PPA-market
- > Shaping the industry: customized solutions at competitive long-term fixed prices with minimal carbon footprint



## **ENCAVIS SUCCESS STORY – STEADY AND DYNAMIC GROWTH PATH**







# Strong Financials

Financial year 2017

ENCAVIS STRONG OPERATIONAL\* FIGURES 2017 - PROFITABLE GROWTH PATH CONTINUED IN 2017



# 2017 - Strong Growth in all KPIs

KPIs (mEUR)	2016	2017	Change (in %)
Revenues	141.8	222.4	+57%
Op. EBITDA	106.1	166.8	+57%
Op. EBIT	61.6	100.4	+63%
Op. Cash flow	103.8	153.0	+47%



# Positive weather effects supported the 2017 financial results

KPIs (mEUR)	2017	Weather related effects	FY2017 adjusted for weather effects
Revenues	222.4	4.3	218.1
Op. EBITDA	166.8	4.3	162.5
Op. EBIT	100.4	4.3	96.1

\*Operational figures do not include non-cash related value effects

# **OPERATING RESULTS 2017 BY SEGMENT**

Operating P&L	Solarparks	Technical Services	Windparks	Asset Management	HQ
Revenue	168.9	0.3	49.5	3.7	-
EBITDA	134.2	1.3	36.4	0.9	-6.0
EBITDA margin	79%	38%	74%	24%	-
EBIT	83.3	1.3	21.7	0.3	-6.2
EBIT margin	49%	38%	44%	8%	-

All costs associated with operating activities (personnel and other costs) were distributed to the segments



# Guidance FY2018

"GUIDANCE 2018"

# Showcase for 2019 including ~100 MW to be connected to the grid end of 2018

Operating P&L (in mEUR)	Result 2017	Weather adjusted (wa) FY2017	Guidance 2018	Change Guidance 2018 - (wa) FY2017 in %		2019	2019 – (wa) FY2017 in %
Revenues	222.4	218.4	>240	+10%	_	~250	+14%
EBITDA	166.8	162.5	>175	+8%			
EBIT	100.4	96.1	>105	+9%			
Cashflow	153.0	n.a.	>163	+7%			
EPS	0.29	0.26	>0.30	+15%		~0.35	+35%

# **GUIDANCE 2018 BY SEGMENTS**

Operating P&L mEUR	Solarparks	Technical Services	Windparks	Asset Management	HQ
Revenue	>175	(internal revenues)	>58	>7	-
EBITDA	>140	>1	>40	>1	<-7
EBITDA margin	80%	32%	69%	14%	-
EBIT	>86	>1	>24	>1	<-7
EBIT margin	49%	30%	41%	14%	-





# Q2/2018 – Operational KPIs

# 6M 2018 ENCAVIS WELL ON TRACK AFTER THE FIRST SIX MONTHS OF 2018\*



# 6M 2018 – Operational KPIs

KPIs (mEUR)	6M 2017	6M 2018	Change (in %)
Revenues	113.8	122.8	+8%
Op. EBITDA	88.0	94.0	+7%
Op. EBIT	55.9	57.9	+3%
Op. Cash flow	69.9	78.3	+12%
EPS	EUR 0,19	EUR 0,19	



# 6M 2018 – Operational KPIs weather adjusted:

KPIs (mEUR)	Weather adjusted 6M 2017	Weather adjusted 6M 2018	Weather adjusted Change (in %)
Revenues	110.8	122.1	+10%
Op. EBITDA	85.0	93.3	+10%
Op. EBIT	52.9	57.1	+8%
Op. Cash flow	-	-	-

\*Operational figures do not include non-cash related value effects

# OPERATING RESULTS 6M 2017 VS. 2018 BY SEGMENT (IN MILLION EURO)

Op. P&L		rparks	Wind	parks	Technica	Services		set jement		Q
			1	X			1	2		
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
Revenue	89.6	92.3	22.5	29.0	0.1	0.2	1.6	1.3	-	-
EBITDA	73.7	76.4	16.1	21.8	0.7	0.7	0.6	-1.1	-4.5	-3.8
EBITDA margin	82%	83%	72%	75%	41%	35%	38%	-	-	-
EBIT	48.6	49.3	9.3	13.1	0.7	0.7	0.3	-1.4	-4.5	-3.9
EBIT margin	54%	49%	41%	44%	41%	38%	19%	-	-	-

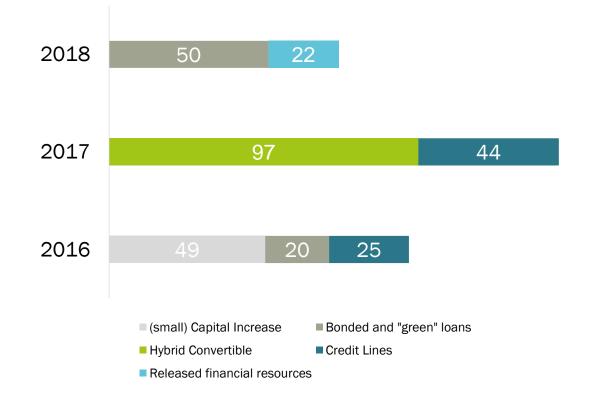
All costs associated with operating activities (personnel and other costs) were allocated to the segments

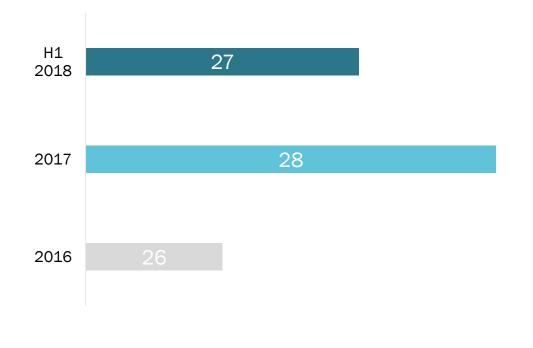


# SECURING GROWTH CAPITAL WHILE KEEPING A STRONG EQUITY RATIO (2016 - 2018\*)

# Financing measures implemented (in mEUR)

Equity ratio (%)







\*Excluding project finance debt and capital increase in the course of the CHORUS takeover 2016

# Our business model

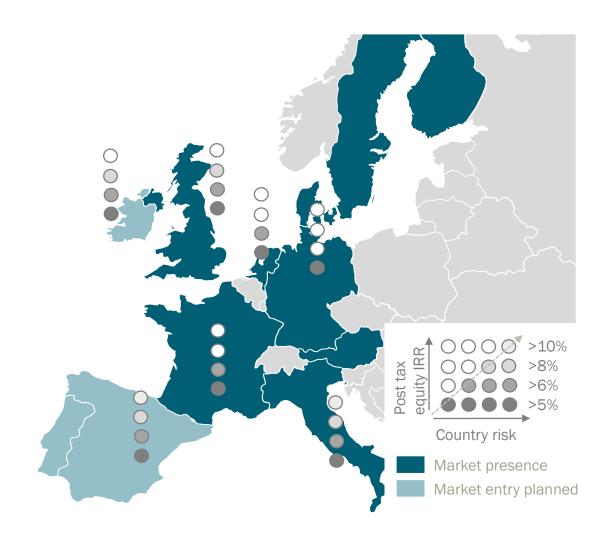
Combining smart finance and sustainable investments in the renewable sector

# THE 4-PILLARS OF OUR BUSINESS

Segments	Business activities
	> Acquisition and operation of ground mounted PV parks
	> Acquisition and operation of onshore wind parks
	<ul> <li>Customized portfolios or fund solutions with an all-round service for institutional investors in renewable energies (Encavis Asset Management)</li> </ul>
	<ul> <li>Technical operation &amp; maintenance of PV parks by our technical service unit (Encavis Technical Services)</li> </ul>

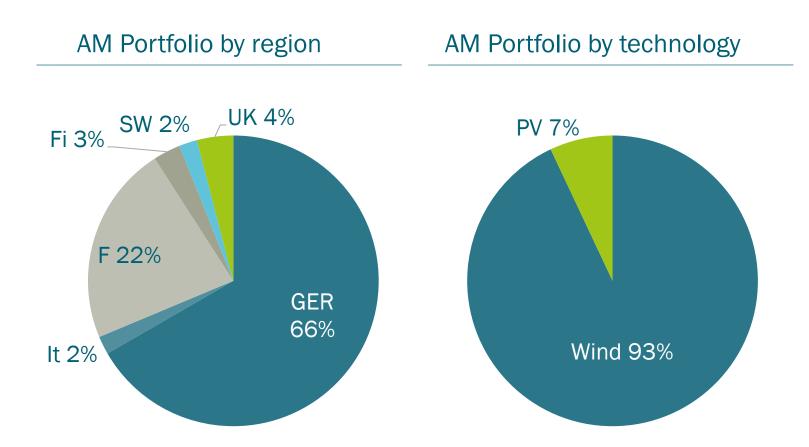
# CONSERVATIVE ACQUISITION STRATEGY (EXAMPLE PV)

- > We acquire ready-to-built, turnkey-projects or existing parks and operate them over their technical and commercial life time
- > We acquire parks that have a fixed and longterm FIT
- > We provide customized solutions with dedicated investments on the basis of longterm PPAs

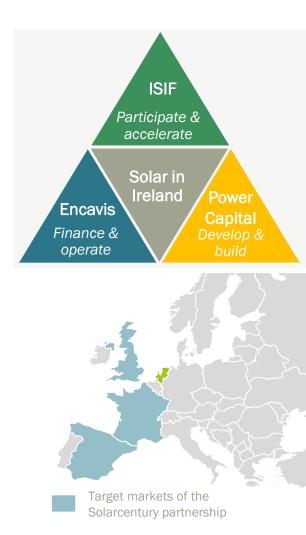


# ASSET MANAGEMENT – OUR EXPERTISE FOR INSTITUTIONAL CLIENTS

- The Asset Management (AM) Portfolio amounts to ~ 430 MW
- Focus: Institutional Investors (e.g. insurance companies, pensions funds, banks, foundations)
- OFFERING: One-stop-shop approach (deal originating, selecting and managing the acquisition, park operation)
- > PRODUCT: Investment funds on the basis of special Luxembourg SICAVfunds/customized portfolios
- FINANCIALS: Management fees add
   5mEUR of recurring revenues



# STRATEGIC PARTNERSHIPS SECURE FUTURE GROWTH



# Ireland Strategic Investment Fund (ISIF) ~140 MW

- > Strategic Partnership with the state fund ISIF and Irish project developer Power Capital
- > Pipeline of >20 PV parks with ~140 MW in Ireland
- > ISIF as co-investor (25%)
- > Strong PPA market, energy intensive industries (e.g. data centres) of multinationals
- > Specified IRR benchmarks

# Solarcentury ~1.1 GW over 3 years

- > Strategic partnership with UK based project developer Solarcentury
- > Pipeline of in total 1.1 GW with projects in Europe and Mexico
- > First park in the Netherlands (43.9 MW) successfully acquired in March 2018
- > Taking over Ready-to-build (RTB) PV parks with specified IRR benchmarks
- > Standardization of processes reduces transaction costs

# Overview Encavis Portfolio

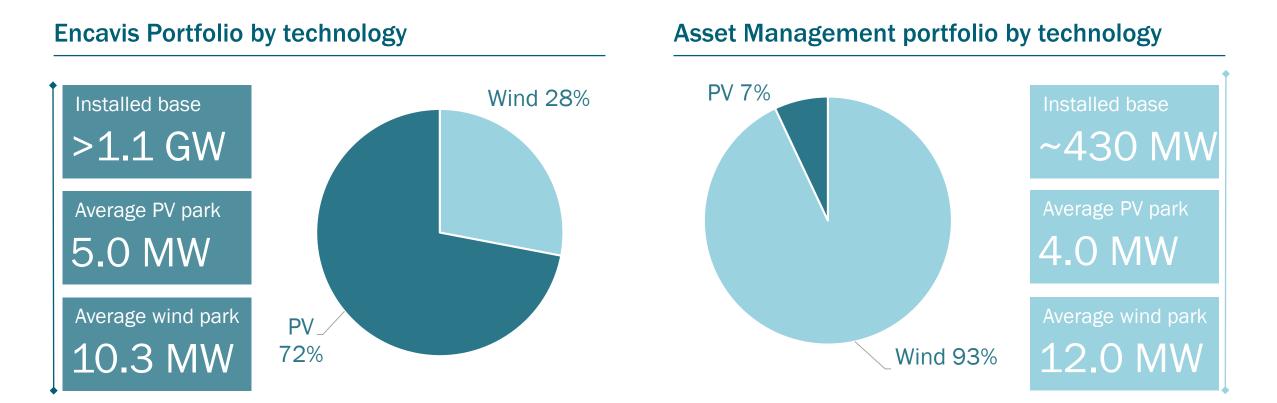
PV and wind parks with a capacity of > 1.5 GW

# 171 SOLAR PV PARKS AND 65 WIND PARKS IN EUROPE WITH AN INSTALLED CAPACITY OF >1.5

WIND PARKS		OWN ASSETS	ASSET MANAGEMENT
Germany	-	215 MW	273 MW
France		36 MW	85 MW
Austria	=	36 MW	-
Finland		-	13 MW
United Kingdom		-	18 MW
Sweden		-	10 MW
Italy		6 MW	-
Denmark		25 MW	-
Total		318 MW	399 MW
SOLAR PARKS		OWN ASSETS	ASSET MANAGEMENT
Germany	-	255 MW	12 MW
Italy		154 MW	7 MW
France		202 MW	12 MW
United Kingdom		127 MW	-
Netherlands		92 MW	-
Total		830 MW	31 MW
GROUP TOTAL		1.578	3 MW

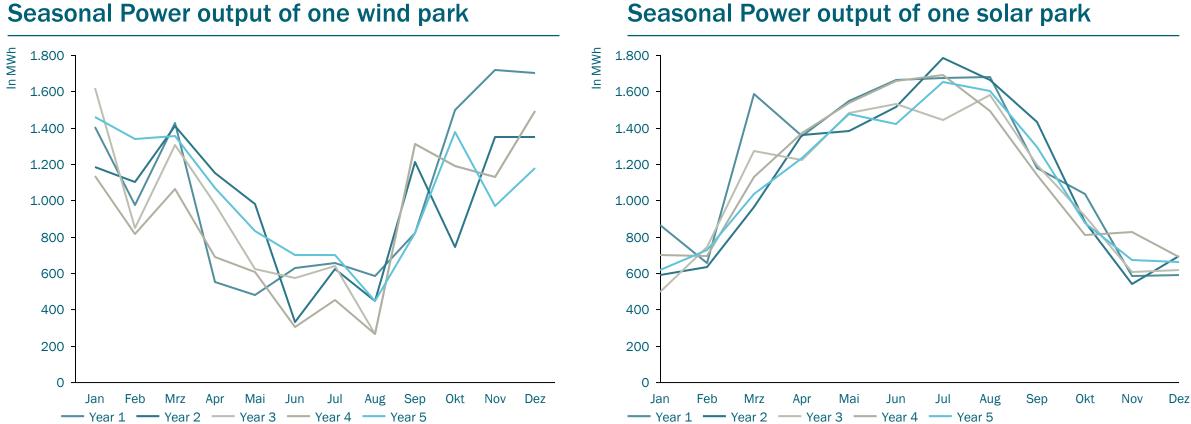


ENCAVIS PORTFOLIO – PV ACCOUNTS FOR >2/3 OF THE ENCAVIS PORTFOLIO



PV >2/3 of the renewable energy asset portfolio of Encavis; ~15 years remaining FIT maturity

DIVERSIFICATION BY TECHNOLOGY (WIND/PV) WITH COMPLEMENTARY INCOME STREAMS OVER THE YEAR



# **Seasonal Power output of one solar park**



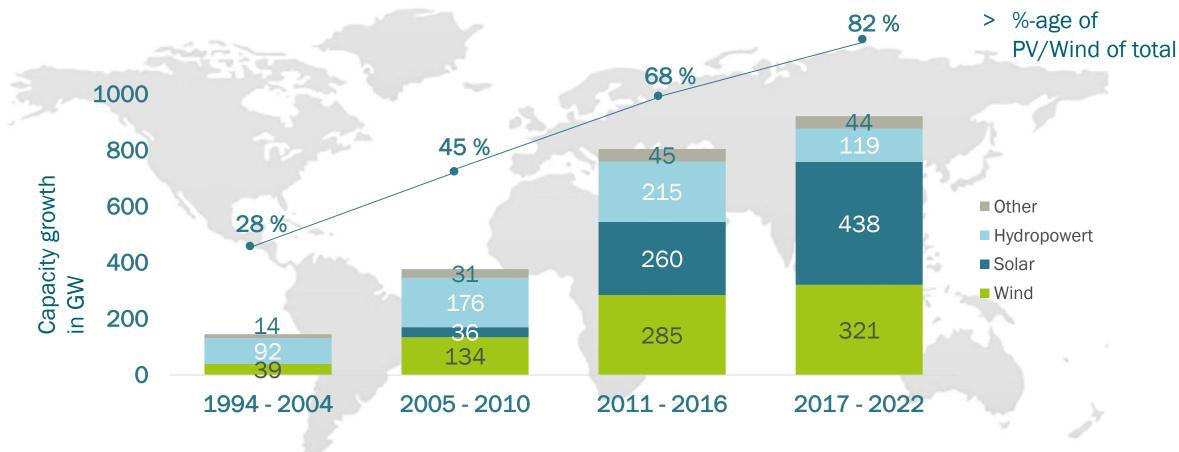
# The future is bright for renewables

Demand for renewables to increase

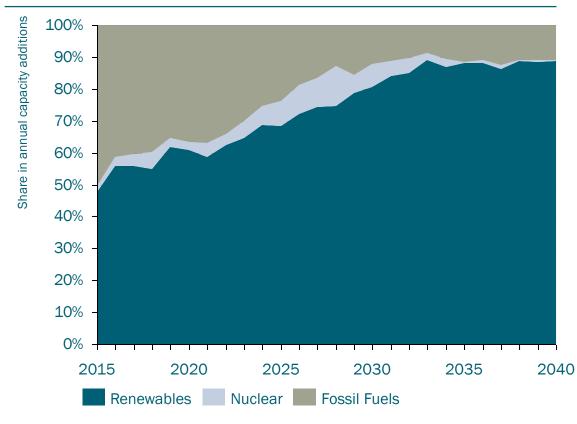
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## WORLDWIDE GROWTH IN GENERATING CAPACITY OF RENEWABLES BY TECHNOLOGY

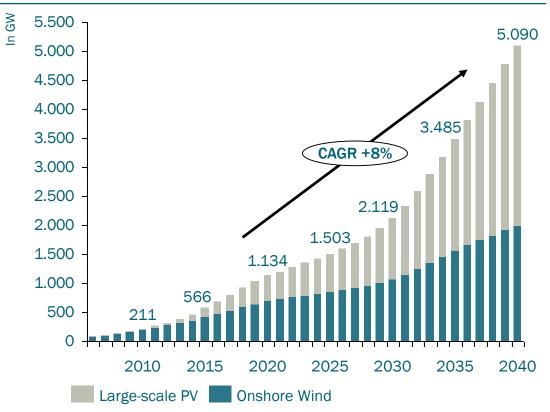


# ENTERING THE CENTURY OF RENEWABLE POWER GENERATION



# Gross capacity additions by technology group

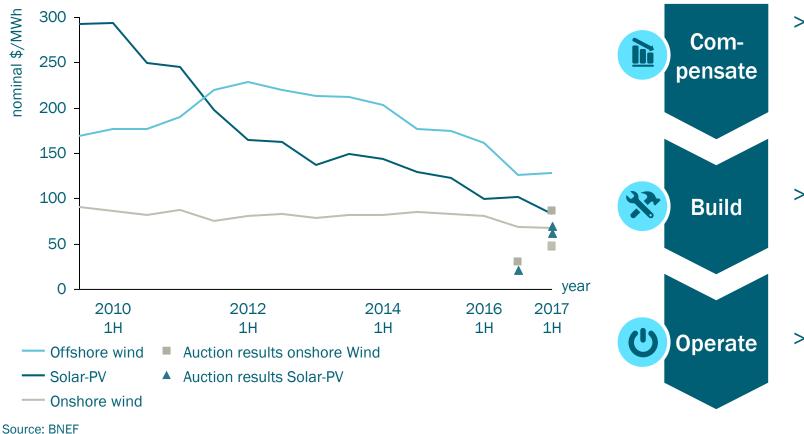
# **Global utility PV- and onshore Wind Capacity**



Source: BNEF

# **GLOBAL GROWTH IS BASED ON NEW COST COMPETITIVENESS**

# Development of global levelized cost of electricity



# **Reasons for cost reductions**

> Shift from government-set tariffs to competitive auctions and longterm power purchase agreements

> Reduction of production- and technology costs

> Increasing experience in O&M

# DEMAND FOR POWER FROM RENEWABLES FROM TWO STRONG PLAYERS: PUBLIC & PRIVATE SECTOR



# Public Sector: Goal to limit global warming

- > COP 21 Paris: 196 countries united to limit global warming below 2°C
- > Europe 20-20-20 targets
- > China: largest installed renewables fleets
- > Denuclearization in Germany and Japan
- > Creation of low-carb economies
- $\rightarrow$  Demand via FIT-schemes and competitive auctions

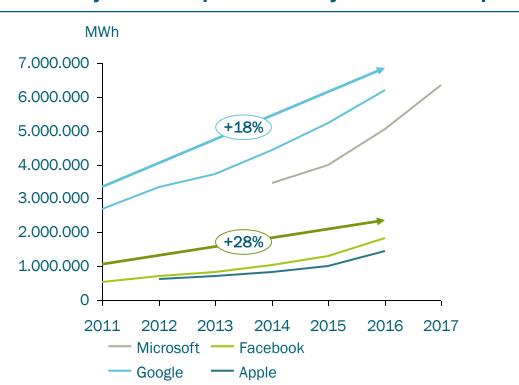
# Private sector: Sustainability goals and long-term supply security

- > Private companies create global initiatives in order to take action on climate change.
- > Multinational companies such as Google, Facebook and Microsoft go ahead with ambitious targets
- > 100% renewable targets help to create a positive brand awareness
- > Furthermore, direct power purchase agreements between companies and power producers from renewable energy resources offer long-term supply at fixed rates

# $\rightarrow$ Demand via PPAs and purchase of green certificates



# CASE 2: HIGH-ENERGY CONSUMING DATA CENTRES OF MULTINATIONALS



# Electricity consumption of Major Tech-Companies

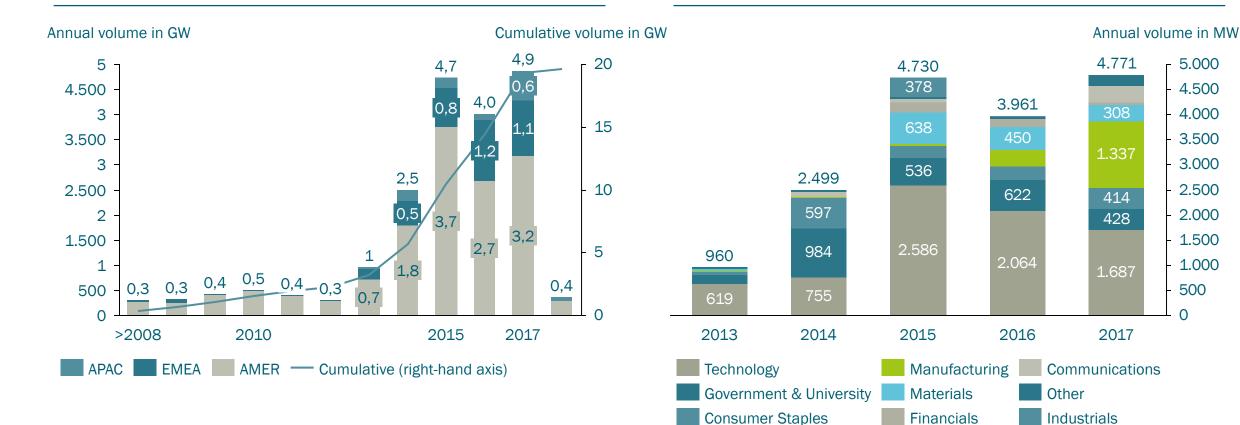
# **Consumption driven by data centres**

- > U.S. data centre electricity consumption in 2014:
   70 billion kilowatt-hours (CAGR 4% until 2020)
- > Global data centre market expected to grow further to \$23bn by 2019 (CAGR +9%)
- > 96% of Facebook's electricity consumption related to its data centres
- > In 2016 Google planned the construction of 12 new cloud data centres

# VOLUME OF GLOBALLY SIGNED CORPORATE PPAS STEADILY GROWING

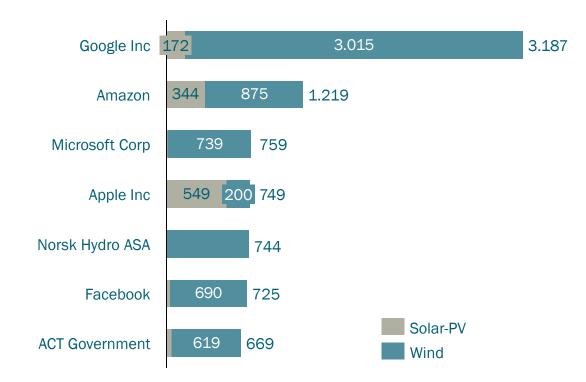
**Global corporate PPA volumes** 





# MAJOR PPA-PLAYERS AND GENERAL MARKET OVERVIEW

# Top offtakers by capacity and source



## **Recent market developments**

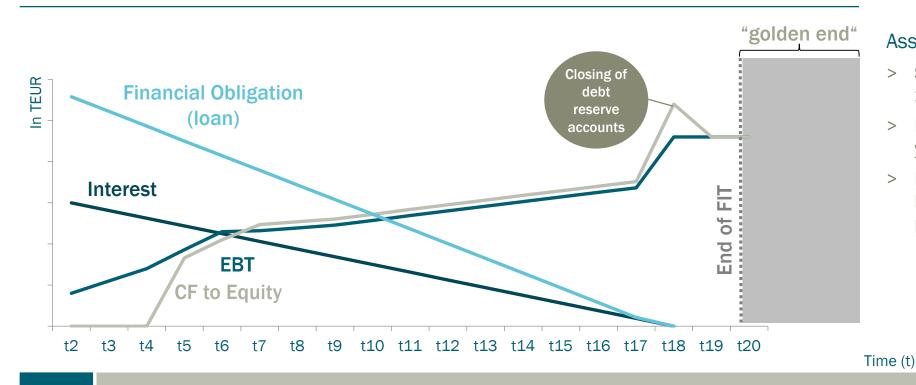
- > North American market with pioneering role
- > US companies search partners for PPAs in Europe
- > ENCAVIS registers increasing demand for PPAs also in Europe (Nordics, Spain, Italy, Ireland)
- > Major PPA deal in Europe in 2017: Norsk Hydro signs PPA until 2039 for 650 MW wind park in Sweden
- > PPAs are contracted for time periods from 6 20 years



# The golden end

# THE "GOLDEN END" OF ENCAVIS'S POWER PLANTS

# Illustration of the different cash flows of a solar PV park



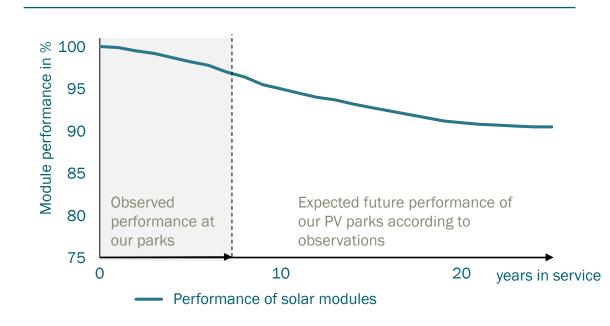
### Assumptions

- Solar-park connected to the grid in 2010 with FIT for 20 years (t20)
- Park is bought in Q2 2011, first full year of operation 2012 (t2)
- Non-recourse project financing will be serviced and paid-off by the park

## As the loan is paid-off during the FIT-period, parks are very profitable in the "golden end"

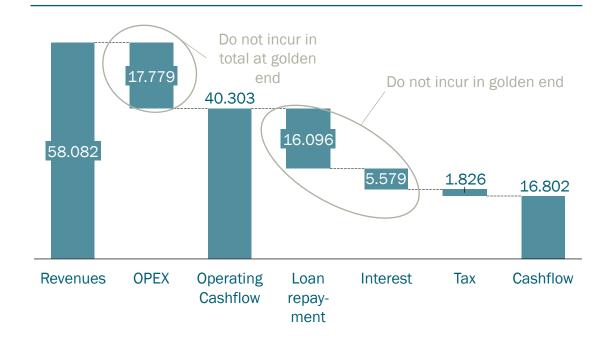
Source: Company data

GOLDEN END" - PV PARKS STILL WITH HIGH EFFICIENCIES AND LOWEST MARGINAL COSTS



**Performance of PV-modules after 20-years** 

# Example\*: Cash flow for one solar park





# Operational excellence

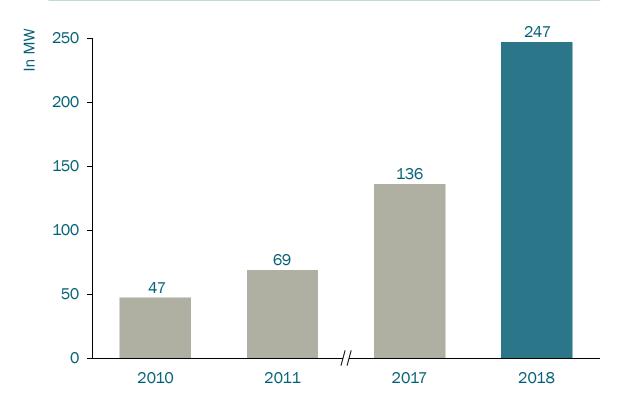
Operating renewable power plants

# ENCAVIS TECHNICAL SERVICES IS RESPONSIBLE FOR THE OPERATION OF OUR PARKS

# **Company profile**

- Specialized in technical operation of PV parks since 2008
- > The team is located in Halle (Saale) and consists of 16 project-experienced engineers, technicians and mechanics
- > Company is accepted by financing banks
- > Broad technology experience:
  - > Crystalline and thin-film modules
  - > Central and string inverters
  - > Different monitoring systems

# Parks managed by Encavis Technical Services



# **INSIGHT INTO OUR 24/7 TECHNICAL PARK OPERATION**



# **Constant monitoring of parks**

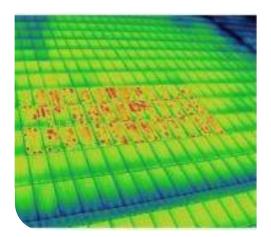
- > Integration of all parks into our centralized 24h control room
- > Calculation of yield reports and simulations based on actual irradiation levels
- > Handling of failure reports 365 days a year
- > Management of fast response fault clearance actions



# **Onsite visits**

- > Failure analysis and repair works directly on site are conducted by experienced and trained team
- > Our service vehicles hold comprehensive stock of spare parts
- For major repairs teams of the component manufacturers are requested (for instance defective power sections)

## **INSIGHT INTO OUR ON-SITE ACTIVITIES**



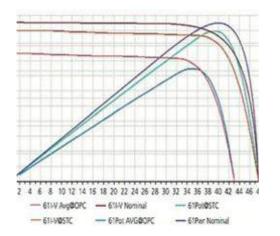
# Thermography

- > Identification of strings with short circuits
- > Adjustment of the polarity

# Repairs

 For instance repair of string-inverters with lightning damages (350 in the last 24 months)





# **Performance tests**

 Performance measurements for strings or single modules show performance reductions

# **Replacing modules**

In 2014 and 2015 our team replaced more than 20,000 defect modules



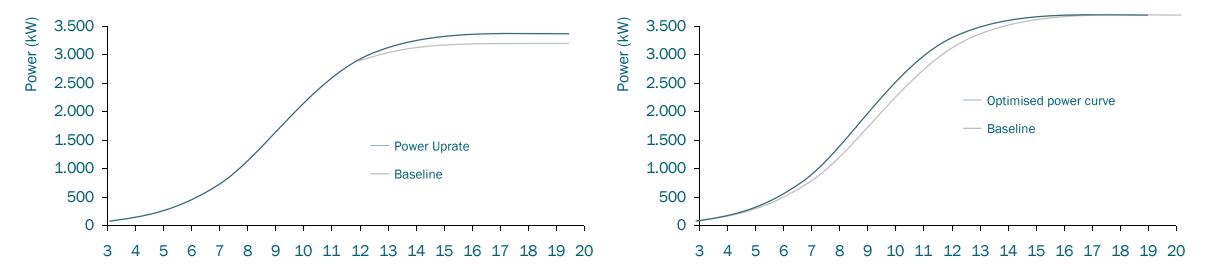
## **OPTIMIZING THE PERFORMANCE OF OUR WIND PORTFOLIO**

## **Power Uprates**

> Power Uprates for installed turbines increase annual electricity production of turbines by up to 3% without effecting the turbine design life

## **Optimizing power curves**

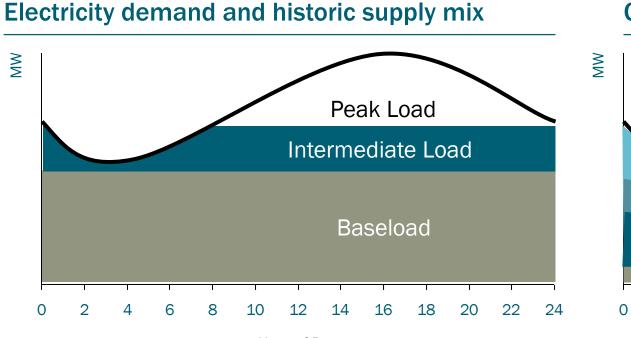
> Improve efficiency of turbine at lower wind speeds through software updates and the optimization of regular downtimes, of blade pitch angle and of gondola alignment





# **Battery Storage** The energy system of the future

# **INCREASING SHARE OF RENEWABLES IN POWER SECTOR CREATES NEW CHALLENGES**

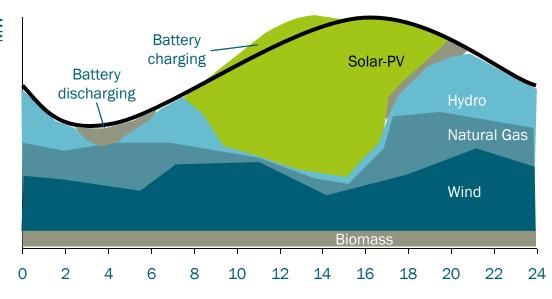


### Hour of Day

- > Supply based on coal, nuclear and gas
- > Large, centralized power plants
- > National markets not interconnected

Source: Own illustration

**Conceptual supply mix in the future** 



#### Hour of Day

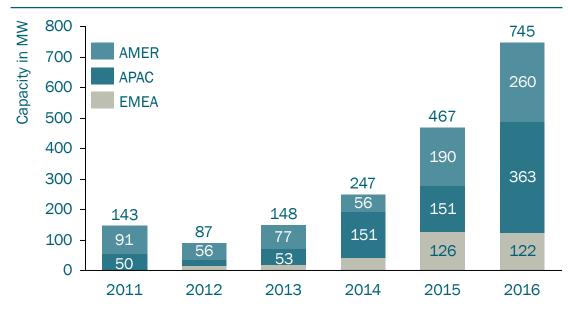
- > Supply based on Renewables and flexible gas power plants
- > Electricity storage with increasing importance
- > Decentralized power generation with prosumers

NEW BUSINESS CASES FOR ELECTRICITY STORAGE

#### Application Possible battery technologies Price-arbitrage for • Time of sale of electricity is independent electricity trading of the time of its generation • Optimising utilization of available Congestion Redox infrastructure (generation and Required Capacity management Flow transmission) Reduce costly peak-loads of large Peak Shaving consumers Lithium-Voltage stability (SDL\*) Stabilization of network operations ion • Participation in the control energy Supply of control energy market, for which RES power plants are (SDL\*) not qualified

# MARKET FOR ELECTRICITY STORAGE IS ALREADY GROWING. PROMISING OUTLOOK

# Annually commissioned utility-scale storage

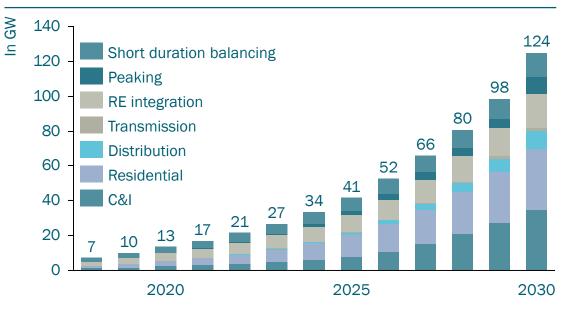


- > Strong increase in annual commissions
- > Growth distributed globally

Source: BNEF

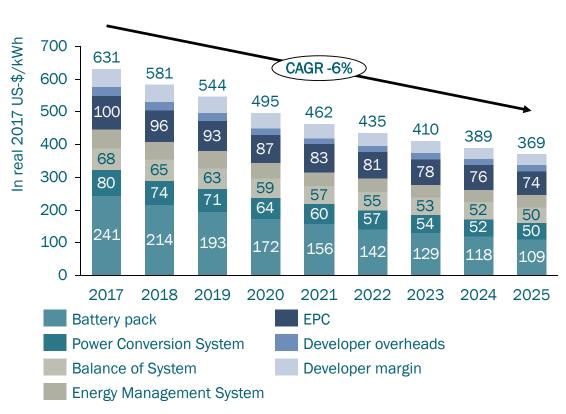
> Lithium-ion technology currently standard technology

# **Future market outlook for storage applications**



- Strong growth in all regions until 2030 as storage is needed to integrate renewables into power sectors and thus guarantee security of supply
- > Decreasing costs drive capacity additions

## AS INSTALLED CAPACITIES INCREASE COSTS ARE FORECASTED TO FALL

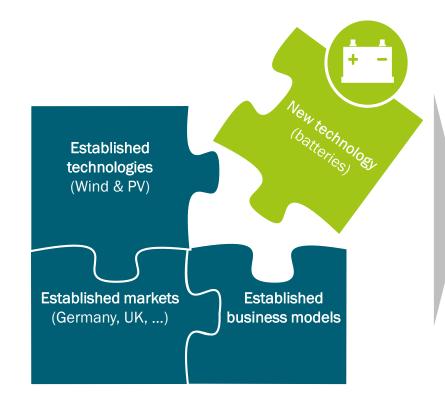


## **Reduction of costs for energy storage systems**

# Case example: Xcel Energy's tender

- Resource solicitation for RES generation plus storage
- > Submission of 400 individual proposals
- Median price for wind-plus-storage projects was \$21/MWh and for solar-plus-storage was \$36/MWh
- > Combined bids are only \$3-\$7 higher than standalone wind- and solar power plants

## BATTERY STORAGE: POSSIBLE MARKET ENTRANCE FOR ENCAVIS



## Business model with minimised risks...

- > Encavis is owner and operator of utility-scale batteries
- Encavis transfers usage of batteries via long-term contracts

## > Projects are bankable

 Partner is responsible for the marketing of the batteryservices

## ... and great opportunities

- > Diversification of Portfolio
- Complementary to RES power generation
- > Early bird advantages
- > Increase revenues of parks after end of FIT ("Golden End")

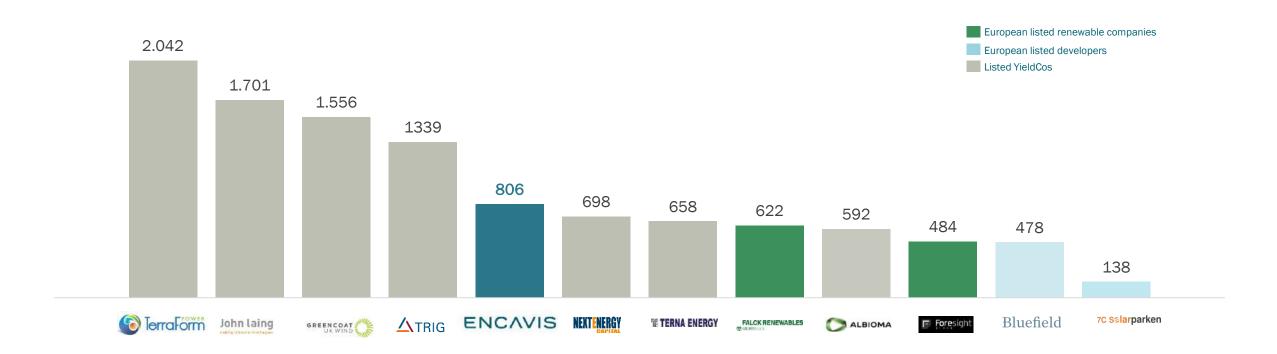






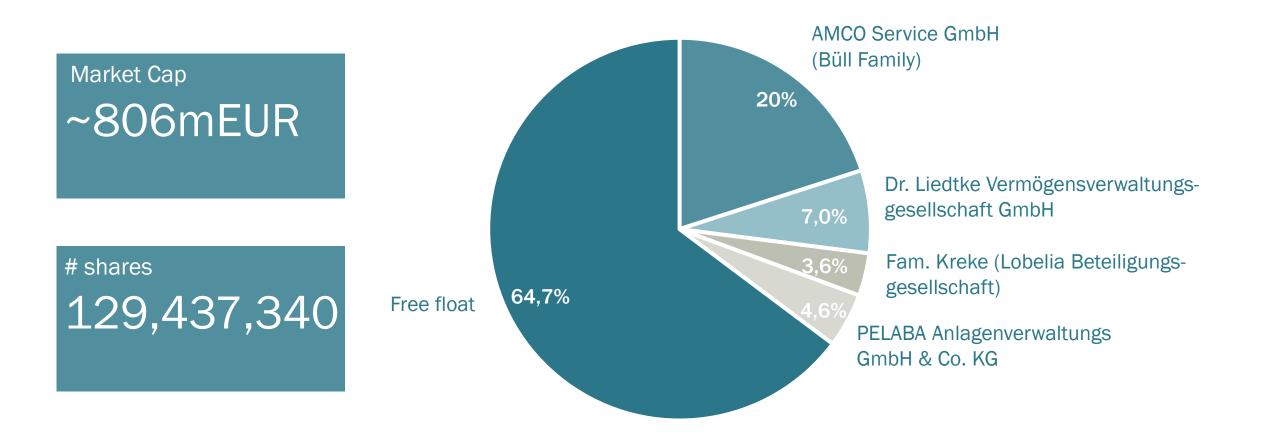
ENCAVIS – ONE OF THE LARGEST INDEPENDENT AND LISTED EUROPEAN RENEWABLE IPPS

# **Benchmarking by market capitalization**





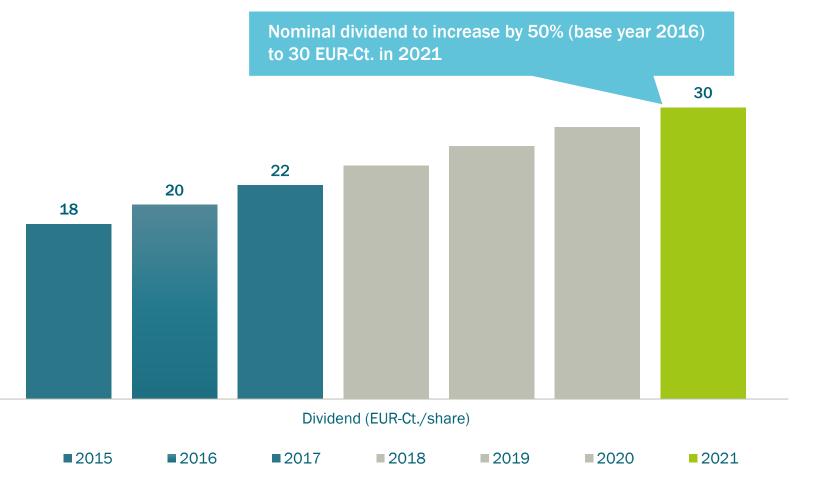
ENTREPRENEURIAL SHAREHOLDER STRUCTURE – STRONG AND LONG TERM ANCHOR INVESTORS



## ATTRACTIVE AND TRANSPARENT DIVIDEND POLICY 2016 - 2021

Dividend policy reflects increasing cash flows from PV/wind parks over time

- > 50% increase of nominal dividend until 2021 (compared to 2016) based on the existing PV/wind park portfolio as of March 31, 2017
- Further acquisitions of PV/wind parks will positively contribute to the dividend potential



ENCAVIS-SHARE – 8 COVERAGES, 100% ,BUY', AVERAGE TARGET PRICE EUR 8.1

			~uy,
Coverage institution	Rating	Date	Target Price (in EUR)
<b>DZ BANK</b>	Buy	August 31, 2018	7.90
Bankhaus Lampe	Buy	May 25, 2018	8.80
	Buy	March 27, 2018	8.50
/VV WARBURG RESEARCH	Buy	April 11, 2017	7.70
	Outperform	March 23, 2018	8.80
ODDO SEYDLER	Buy	June 12, 2018	7.70
QUIRIN	Buy	January 18, 2018	8.30
BAADER /	Buy	May 24, 2018	7.80
Consensus	100% Buy	-	8.23

Coverage 9 & 10: initiation by leading German and French bank expected beginning September 2018





# MANAGEMENT TEAM WITH GREAT INDUSTRY EXPERTISE AND STRONG PASSION FOR RENEWABLES



#### Dr. Dierk Paskert

- > Since September 2017 CEO at Encavis AG
- > CEO Rohstoffallianz GmbH
- > Member of the Management Board of E.ON-Energie AG
- > E.ON AG Düsseldorf, SVP Corporate Development
- > Member of the Management Board Schenker AG



## Dr. Christoph Husmann

- > Since October 2014 CFO at Encavis AG
- Member (CFO) and later Chairman of the Management Board of HOCHTIEF Projekt Entwicklung GmbH
- STINNES AG and HOCHTIEF AG, Head of Corporate Controlling and M&A
- > VEBA AG, Controlling

# SUPERVISORY BOARD



## Dr. Manfred Krüper (Chairman)

- Member of the Board of Directors at E.ON AG (until Nov. 2006)
  - Supervisory Board (a.o.): Coal & Minerals GmbH, EQT Partners investment consultancy GmbH; EEW Energy from Waste GmbH



## Dr. Cornelius Liedtke

- Entrepreneur and co-owner of the B&L Group
- Supervisory board (a.o.): GL Aktiengesellschaft, Dichtungstechnik G. Bruss GmbH & Co. KG



### Prof. Fritz Vahrenholt

- Until January 2014 chairman of the supervisory board at RWE Innogy GmbH (previously CEO)
- Supervisory board (a.o.): Aurubis AG, RADAG and Putz & Partner Unternehmensberatung AG



#### Alexander Stuhlmann

- Until December 2006 CEO at HSH
   Nordbank and thereafter until April
   2008 CEO at WestLB AG
- Supervisory board (a.o.): HCI Capital AG, alstria office REIT-AG, Euro-Aviation Versicherungs-AG



#### Prof. Dr. Klaus-Dieter Maubach

- Entrepreuneur and director of the maubach.icp GmbH
- November 2015 November 2016 CEO at Capital Stage; before CEO at E.ON Avacon AG & E.ON Energy AG



## Christine Scheel

- Until October 2016 member of the supervisory board at CHORUS Clean Energy AG
- Former member of the German parliament



#### Albert Büll

- > Entrepreneur and co-owner of the B&L Group
- Supervisory board (a.o.): Kalorimeta AG & Co. KG, URBANA Energietechnik AG & Co. KG, Dichtungstechnik G. BRUSS GmbH & Co. KG



## Dr. Henning Kreke

- Previously 15 years as CEO at Douglas Holding AG
  - Supervisory board (a.o.): Deutsche EuroShop AG; Thalia Bücher GmbH



#### Peter Heidecker

- Until October 2016 chairman of the supervisory board at CHORUS Clean Energy AG
- Founder of the CHORUS GmbH in 1998

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