

**MVV ENERGIE**  
**ENERGISING ► MY FUTURE**

**ENERGY FOR  
OUR CUSTOMERS:  
DECENTRALISED  
AND EFFICIENT**

**FACT BOOK**  
**1<sup>ST</sup> HALF 2014/15 PURSUANT TO IFRS**  
**15 MAY 2015**

 **MVV Energie**

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**KEY FINANCIAL DATA FOR  
THE 1<sup>ST</sup> HALF OF 2014/15**

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# Key figures of the MVV Energie Group for the 1<sup>st</sup> half of 2014/15 financial year – Adjusted

in Euro million	1 Oct 2014 to 31 Mar 2015	1 Oct 2013 to 31 Mar 2014	% change
Sales excluding energy taxes <sup>1</sup>	<b>1 841</b>	2 056	-10
Adjusted EBITDA <sup>1, 2</sup>	<b>230</b>	226	+2
Adjusted EBIT <sup>1, 2</sup>	<b>154</b>	150	+3
Adjusted EBT <sup>1, 2</sup>	<b>138</b>	121	+14
Adjusted net income for period <sup>1, 2</sup>	<b>98</b>	87	+13
Adjusted net income for period after minority interests <sup>1, 2</sup>	<b>82</b>	72	+14
Adjusted earnings per share <sup>1, 2</sup> (Euro)	<b>1.25</b>	1.10	+14
Cash flow from operating activities <sup>1</sup>	<b>5</b>	62	-92

<sup>1</sup> previous year`s figures adjusted

<sup>2</sup> excluding non-operating financial derivative measurement items, excluding structural adjustment for part-time early retirement and including interest income from finance leases

# Sales excluding energy taxes by reporting segments in the 1<sup>st</sup> half of 2014/15 financial year

in Euro million

	1 Oct 2014 to 31 Mar 2015	1 Oct 2013 to 31 Mar 2014	% change
Generation and Infrastructure <sup>1</sup>	221	193	+15
Trading and Portfolio Management <sup>1</sup>	384	549	-30
Sales and Services <sup>1</sup>	1 170	1 244	-6
Strategic Investments <sup>1</sup>	65	68	-4
Other Activities <sup>1</sup>	1	2	-50
<b>Total</b>	<b><u>1 841</u></b>	<b><u>2 056</u></b>	<b>-10</b>

<sup>1</sup> previous year`s figures adjusted

# Adjusted EBIT by reporting segments in the 1<sup>st</sup> half of 2014/15 financial year

in Euro million

	1 Oct 2014 to 31 Mar 2015	1 Oct 2013 to 31 Mar 2014	+/- change
Generation and Infrastructure	<b>97</b>	83	+14
Trading and Portfolio Management	<b>-8</b>	-10	+2
Sales and Services	<b>38</b>	43	-5
Strategic Investments <sup>1</sup>	<b>23</b>	27	-4
Other Activities <sup>1</sup>	<b>4</b>	7	-3
<b>Total</b>	<b><u>154</u></b>	<b><u>150</u></b>	<b><u>+4</u></b>

<sup>1</sup> previous year`s figures adjusted

# Reconciliation of EBIT (income statement) with adjusted EBIT in the 1<sup>st</sup> quarter of 2014/15 financial year

in Euro million

	1 Oct 2014 to 31 Mar 2015	1 Oct 2013 to 31 Mar 2014	+/- change
EBIT as reported in income statement <sup>1</sup>	151	162	-11
Financial derivative measurement items <sup>1</sup>	–	-15	+15
Structural adjustment for part-time early retirement	+2	+1	+1
Interest income from finance leases <sup>1</sup>	+1	+2	-1
<b>Adjusted EBIT</b>	<b>154</b>	<b>150</b>	<b>+4</b>

<sup>1</sup> previous year`s figures adjusted

# Key factors in the 1<sup>st</sup> half of 2014/15 financial year affecting adjusted EBIT performance

## Positive factors

- ▶ Expansion of renewable energy generation portfolio and renewable energies project development
- ▶ New Block 9 at Grosskraftwerk Mannheim (GKM) in trial operations
- ▶ Non-recyclable waste incineration and energy generation plant in Leuna (TREA Leuna): additional coupling out of process steam

## Negative factors

- ▶ Mild weather and low wind volumes
- ▶ Lower electricity prices on the wholesale market and continuing low clean dark spread (CDS)
- ▶ Environmental business: start-up costs UK



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**KEY FINANCIAL DATA FOR  
THE 2013/14 FINANCIAL YEAR**

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# 2013/14 financial year at a glance

- ▶ **Sales reduce from Euro 4.04 billion to Euro 3.79 billion**
- ▶ **Adjusted EBIT of Euro 173 million in line with forecast**
- ▶ **At Euro 321 million, investments remain high following record previous year`s figure**
- ▶ **More than half of electricity in generated from renewable energies and in combined heat and power (CHP) generation**
- ▶ **Annual net income of Euro 85 million and earnings per share of Euro 1.29 both unchanged on previous year**
- ▶ **Dividend of Euro 0.90 per share**

# Key figures of the MVV Energie Group for the 2013/14 financial year – Adjusted

in Euro million

	2013/14	2012/13	% change
Sales excluding energy taxes	<b>3 793</b>	4 044	-6
Adjusted EBITDA <sup>1, 2</sup>	<b>338</b>	376	-10
Adjusted EBIT <sup>1, 2</sup>	<b>173</b>	208	-17
Adjusted EBT <sup>1, 2</sup>	<b>130</b>	143	-9
Adjusted annual net income <sup>1, 2</sup>	<b>92</b>	101	-9
Adjusted annual net income after minority interests <sup>1, 2</sup>	<b>85</b>	85	0
Adjusted earnings per share <sup>1, 2</sup> (Euro)	<b>1.29</b>	1.29	0
Cash flow from operating activities <sup>2</sup>	<b>418</b>	372	+12

<sup>1</sup> excluding non-operating financial derivative measurement items, excluding structural adjustment for part-time early retirement, excluding restructuring expenses and including interest income from finance leases

<sup>2</sup> previous year`s figures adjusted

# Sales excluding energy taxes by reporting segments in the 2013/14 financial year

in Euro million

	2013/14	2012/13	% change
Generation and Infrastructure	403	390	+3
Trading and Portfolio Management	910	1 054	-14
Sales and Services	2 278	2 356	-3
Strategic Investments	198	243	-19
Other Activities	4	1	>+100
Total	<u>3 793</u>	<u>4 044</u>	-6

# Adjusted EBIT by reporting segments in the 2013/14 financial year

in Euro million

	2013/14	2012/13	+/- change
Generation and Infrastructure	124	149	-25
Trading and Portfolio Management	-22	-16	-6
Sales and Services	31	40	-9
Strategic Investments	31	32	-1
Other Activities <sup>1</sup>	9	3	+6
<b>Total</b>	<b>173</b>	<b>208</b>	<b>-35</b>

<sup>1</sup> previous year`s figure adjusted

# Reconciliation of EBIT (income statement) with adjusted EBIT in the 2013/14 financial year

in Euro million

	2013/14	2012/13	+/- change
EBIT as reported in income statement	191	210	-19
Financial derivative measurement items	-24	+3	-27
Structural adjustment for part-time early retirement <sup>1</sup>	+2	+2	0
Restructuring expenses <sup>1</sup>	–	-11	+11
Interest income from finance leases	+4	+4	0
Adjusted EBIT	<u>173</u>	<u>208</u>	<u>-35</u>

<sup>1</sup> previous year`s figures adjusted

# Key factors in the 2013/14 financial year affecting year-on-year adjusted EBIT performance

## Positive factors

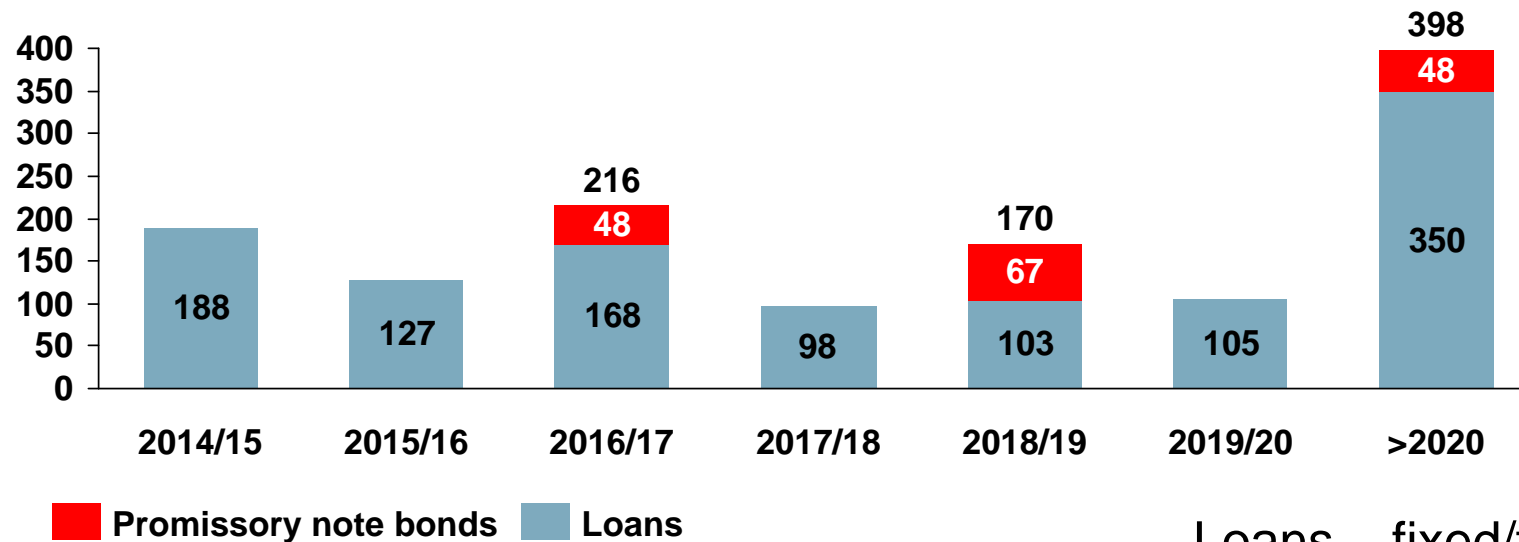
- ▶ Expansion of renewable energy generation portfolio
- ▶ Special items at MVV Enamic subgroup
- ▶ Loss of charge from downtime due to turbine damage in environmental business in previous year
- ▶ Cost discipline

## Negative factors

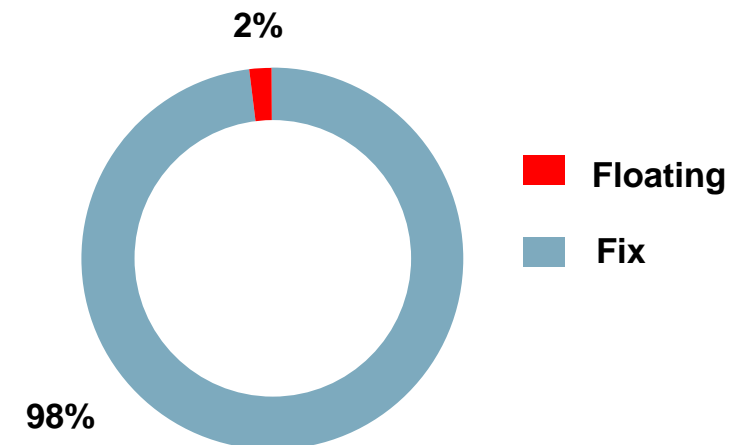
- ▶ Significantly mild weather conditions
- ▶ Continuing low clean dark spread (CDS)
- ▶ Since January 2013, CO<sub>2</sub> emission allowances previously allocated free of charge to be auctioned
- ▶ Lower waste prices

# MVV Energie has a solid financing profile

## Repayment profile in Euro million



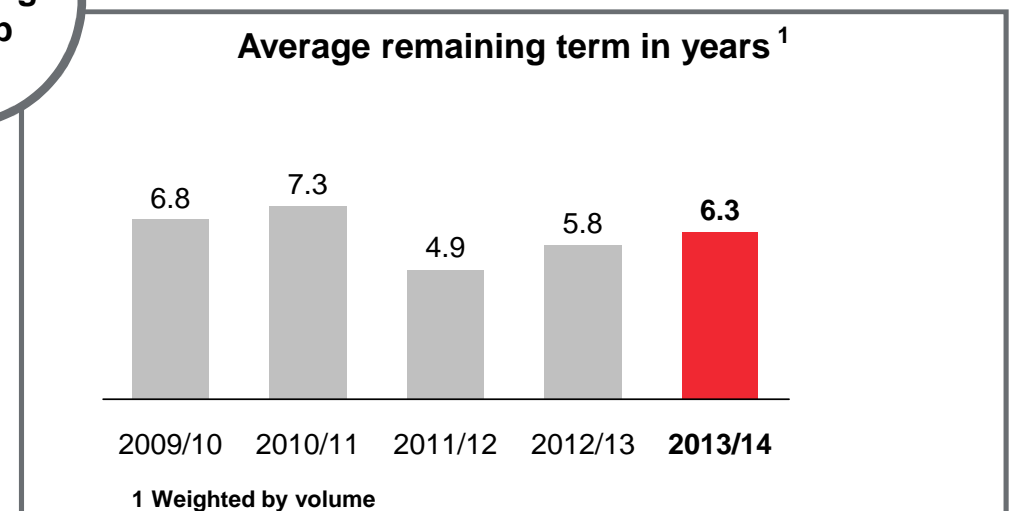
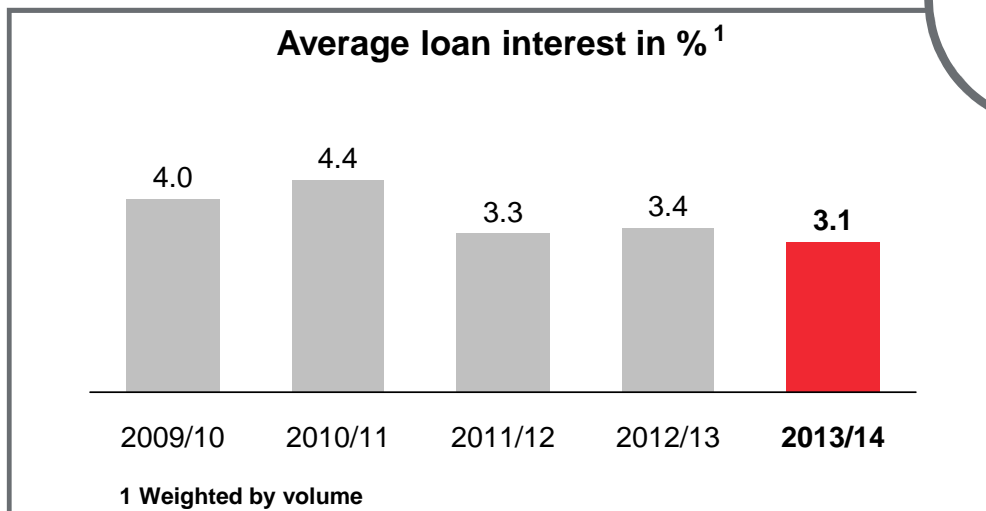
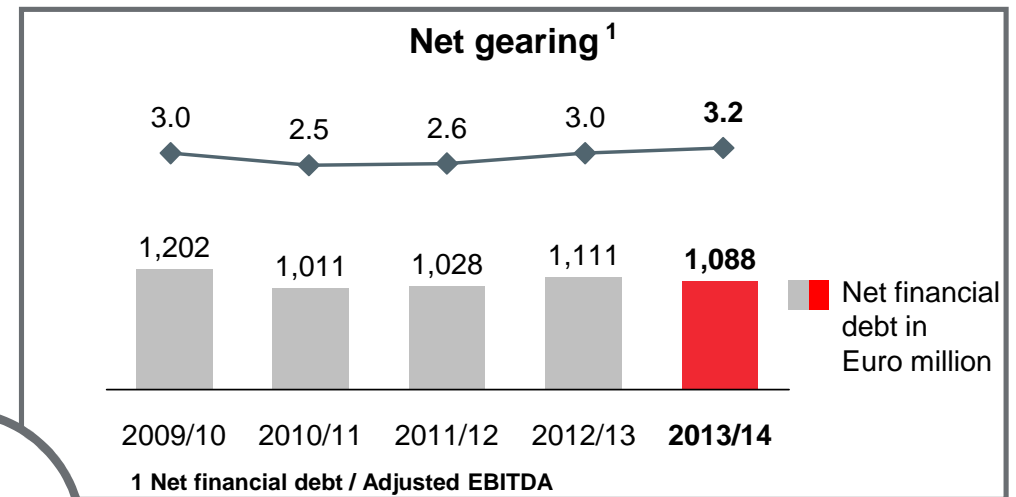
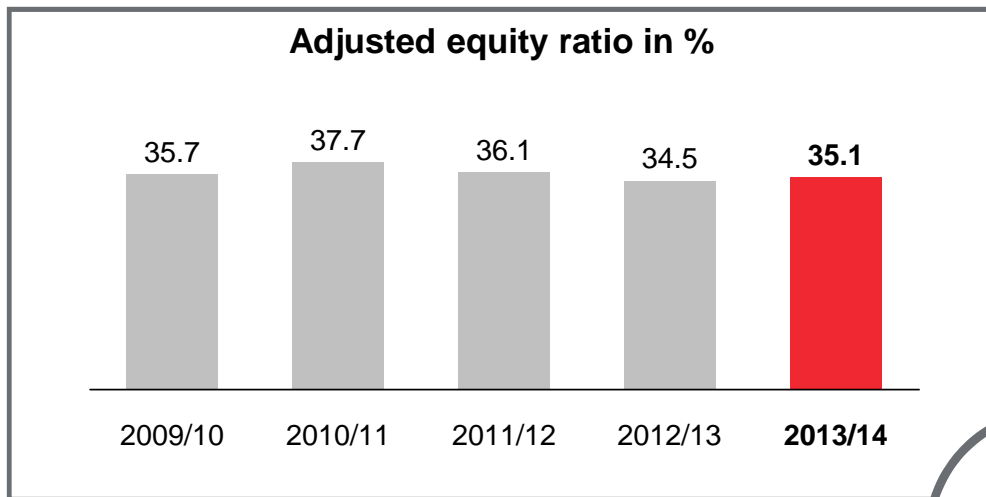
## Loans – fixed/floating shares



- ▶ Well-balanced maturity profile
- ▶ Long-term financing for investments, i.e. congruent terms
- ▶ High share of fixed interest agreements secures favourable rates on long-term basis



# Development in key financial figures



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# ENERGY MARKET TRANSFORMATION AND RENEWABLE ENERGIES

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# The energy industry faces fundamental transformation

## Old world



### Energy supply

- ▶ Central, conventional large power plants
- ▶ Central system management
- ▶ Consumers or points of consumption

## New world



### Energy management

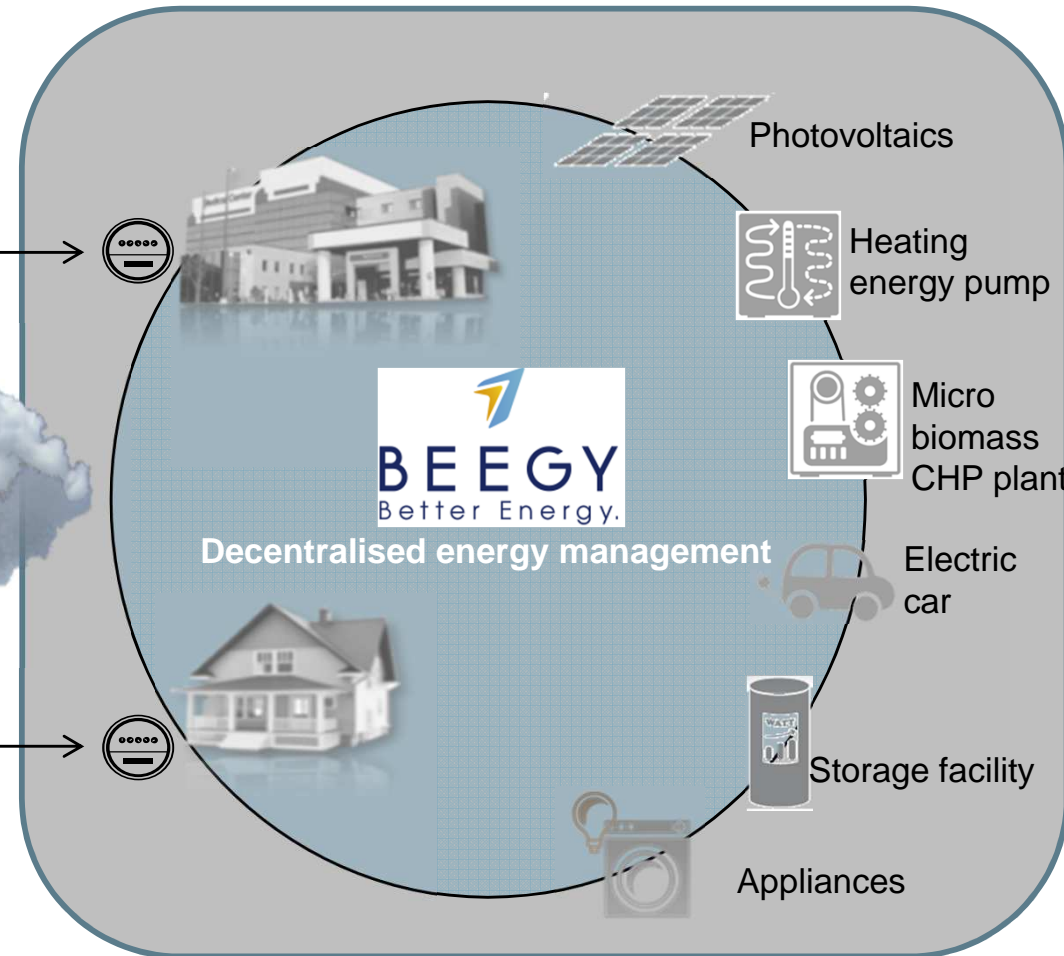
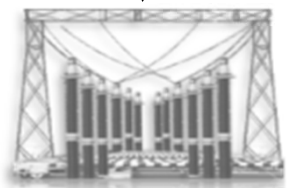
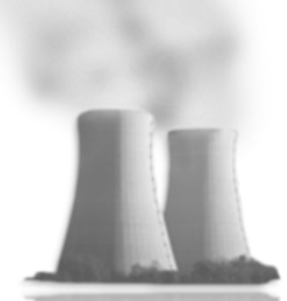
- ▶ Central and decentralised generation, mix of conventional and renewable sources
- ▶ Central and decentralised system management
- ▶ Customers and prosumers

# New technologies bridge the missing link to integrate decentralised plants into the energy market

Large power plants

Grid control centres

**Energy management platforms**



Transformer stations

Local grid stations

# Renewable energies (RE) and combined heat and power (CHP) generation in MVV Energie's portfolio

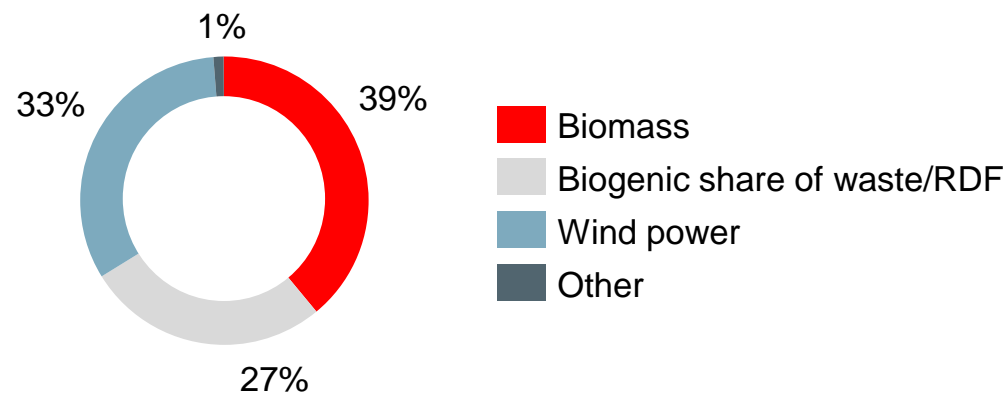


2013/14

2012/13

Share of electricity from RE and CHP	51%	52%	➔
RE electricity capacity	344 MW <sub>e</sub>	315 MW <sub>e</sub>	➔
Direct marketing (capacity under contract)	2 600 MW	2 400 MW	➔
Heating energy and steam generation (CHP)	5.1 bn kWh	5.6 bn kWh	➔
CO <sub>2</sub> emissions <sup>1</sup>	3.8 m tonnes	4.0 m tonnes	➔
CO <sub>2</sub> emissions avoided <sup>2</sup>	0.7 m tonnes	0.6 m tonnes	➔

Electricity generation from renewable energies at the MVV Energie Group in Germany in FY 2013/14: 872 million kWh



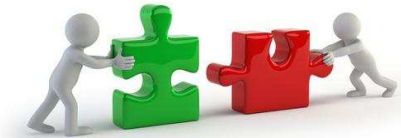
## Core statements:

- ▶ Well-balanced generation portfolio
- ▶ Wind power playing an ever greater role
- ▶ Share of electricity from RE and CHP > 50%
- ▶ Absolute reduction in direct CO<sub>2</sub> emissions
- ▶ CO<sub>2</sub> avoidance increased

<sup>1</sup> Direct CO<sub>2</sub> emissions of the MVV Energie Group

<sup>2</sup> CO<sub>2</sub> emissions avoided due to electricity from RE plants (as per BMU avoidance factors)

# Strong partnership with juwi AG



## “Energiser of the Future”

- ▶ Pioneer in transformation of German energy system
- ▶ One of Germany’s leading energy companies

## Together

- ▶ Strong partnership as opportunity for both companies to enhance and strengthen their businesses
- ▶ Long-term cooperation in core activities and value chains

## Renewable energies pioneer

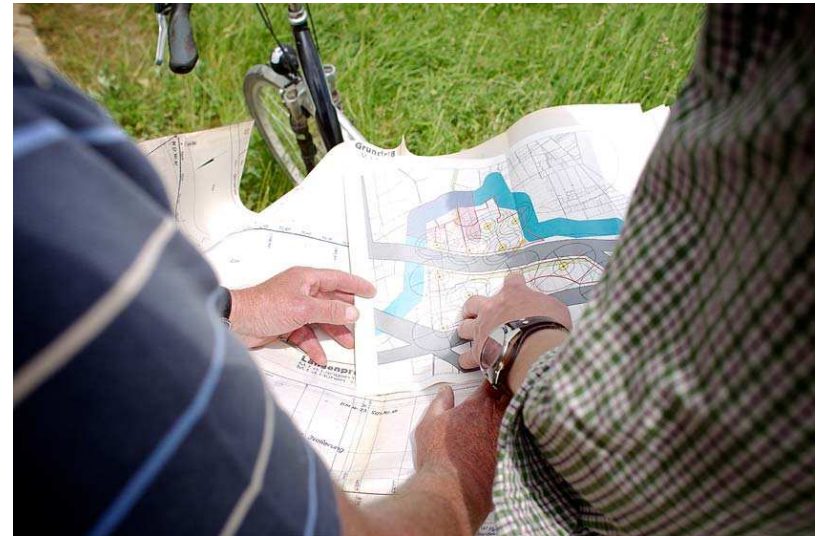
- ▶ Market leader in developing wind and solar projects
- ▶ Strong project development competence

▶ **MVV Energie is convinced by juwi’s restructured business model and strategy**

# Acquisition of Windwärts Energie GmbH – Extension to value chain



- ▶ **Implementation of MVV Energie's generation strategy** by acquiring a regional project developer with key focus on Lower Saxony
- ▶ **Objective of expanding our wind portfolio** will be supported by
  - Boosting internal competencies (project development, operations management) and
  - Securing access to projects
- ▶ **French activities** represent an opportunity



# MVV Energie's generation strategy focuses on growth market of onshore wind power

## Generation strategy for renewable energies

- 1** Development of renewables electricity generation portfolio with focus on onshore wind power
  - ▶ Core element of MVV 2020 strategy
- 2** Extension in value chain with focus on project development (PD)
  - ▶ PD with value contribution, but different risk structure
- 3** Expansion in effective asset management
  - ▶ Optimisation over plant lifecycle (planning, operations, direct marketing)
  - ▶ Aim: independent of ownership
- 4** Exploitation of opportunities abroad
  - ▶ Systematic analysis of renewable energies in Europe

## Acquisition of Juwi and Windwärts

- ▶ Acquisition of Windwärts and cooperation with Juwi as opportunity to significantly expand proprietary project development
- ▶ Boosting competence in operations management and direct marketing also lays a foundation for effective asset management
- ▶ The access to a pipeline in development at Juwi and Windwärts can be used as a basis for further expansion in the proprietary asset portfolio
- ▶ Increasing international share at Juwi (worldwide) and Windwärts (France) reduces dependence on national subsidy systems



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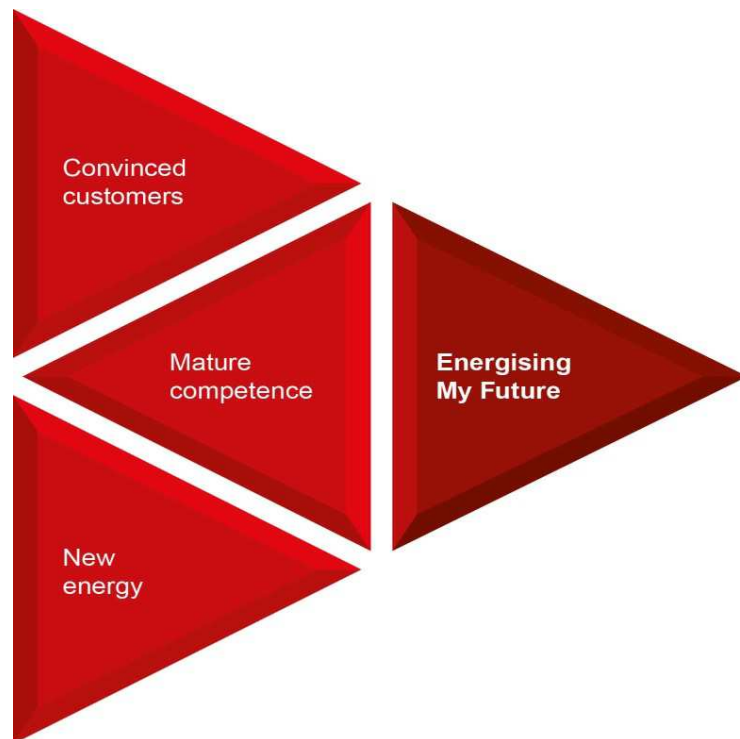
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**MVV ENERGIE –  
IMPLEMENTATION OF OUR STRATEGY**

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“Others talk about the energy turnaround.  
We make it happen.”

## ENERGISING MY FUTURE



### **Convinced customers**

We consistently align our products and services to our customers' individual needs and expectations. By offering excellent service and innovative solutions, we aim to convince and inspire our customers with our appreciation of them.

### **Mature competence**

Drawing on our employees' longstanding experience and expertise, we are actively shaping the energy system transformation. As a learning organisation, we unite our competencies with excellent processes and high-capacity performance and work to enhance these factors with a view to the future.

### **New energy**

The energy system of the future will be created by smartly combining renewable and conventional energies. MVV Energie is one of the pioneers of this transformation. We are combining this approach with our innovative strength and our focus on sustainability.

# Investment and growth

## Investments in 2013/14 financial year



### ► Growth

- Construction of wind farm Hungerberg
- Construction of Kroppenstedt and Staßfurt biomethane plants
- Construction of Ridham Dock biomass power plant
- Construction of Plymouth energy from waste plant
- Extending the supply of district heating in Mannheim
- Takeover of electricity grids in Ilvesheim and Ketsch

### ► Existing business

- Optimising and preserving substance of supply facilities and distribution grids

# Plymouth energy from waste plant project

## South West Devon Waste Partnership



### Investment and financing

- ▶ **Investment:** approx. Euro 250 million
- ▶ **Financing:** secured with KfW IPEX-Bank, Svenska Handelsbanken and EIB
- ▶ **Start of main construction work:** August 2012
- ▶ **Launch of operations:** 2015

### Technical data

- ▶ **Thermal use of waste volume:** 245,000 tonnes p.a.
- ▶ **Net electricity output:** 22.5 MW<sub>e</sub>
- ▶ **Max. thermal energy output:** 23.3 MW<sub>t</sub>

### Broad and secure revenue base

- ▶ Municipal waste contract: 25-year term, 75% bring-or-pay
- ▶ Energy supply contract with a 25-year term to supply electricity and steam to navy base
- ▶ Government support for cogeneration and generation of renewable energy from biogenic share of waste

# Biomass power plant project in Ridham Dock (UK)

## Biomass power plant Ridham Dock



### Investment and financing

- ▶ **Investment:** approx. Euro 140 million
- ▶ **Financing:** corporate funding
- ▶ **Start of main construction work:** April 2013
- ▶ **Launch of operations:** 2015

### Technical data

- ▶ **Thermal use of waste wood volume:** 172,000 tonnes p.a.
- ▶ **Net electricity output:** 23.2 MW<sub>e</sub>
- ▶ **Electricity generation:** approx. 188 million kWh p.a.
- ▶ **Optional combined heat and power generation (CHP)**

### Broad and secure revenue base

- ▶ More than 1 million tonnes of waste wood in the catchment area
- ▶ State support of the production of renewable energy from biomass

# Biomethane plant Staßfurt – third step towards building up a biomethane cluster in Saxony-Anhalt

## Biomethan at Staßfurt location

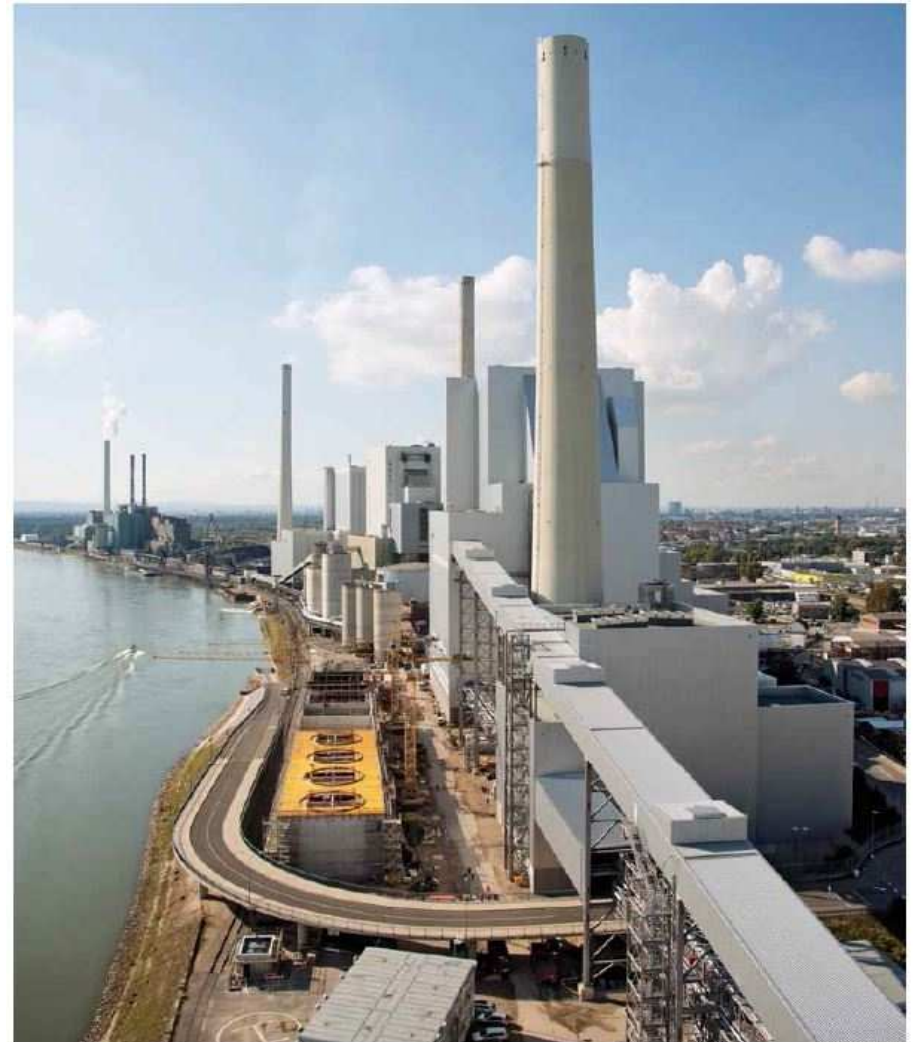
- ▶ **Launch of construction work:** June 2014
- ▶ **Launch of operations:** May 2015
- ▶ **Investment:** roughly Euro 14 million
- ▶ **Output:** approx. 3 MW<sub>e</sub>
- ▶ **Biogas production:** 63.5 million kWh p.a.  
(equivalent to electricity consumption of 6,000 families and heating energy need of 1,200 households)
- ▶ **Gas output:** 695 Nm<sup>3</sup> per hour of biomethane  
(in natural gas quality)
- ▶ **Raw materials requirement:** approx. 62,000 tonnes p.a.,  
mainly maize silage, sugar beet, cuttings and winter crops
- ▶ **CO<sub>2</sub> savings:** 20,000 t/a
- ▶ **Planned operating term:** 26 years



# Grosskraftwerk Mannheim (GKM)

## Grosskraftwerk Mannheim (GKM)

- ▶ **Launch of operations** at Block 9: May 2015
- ▶ **Shareholder structure** in GKM: 28% MVV Energie, 40% RWE, 32% EnBW
- ▶ **Gross electricity generation capacity** at GKM: 1,675 MW<sub>e</sub>
- ▶ **Gross electricity generation capacity** at new Block 9: 911 MW<sub>e</sub>
- ▶ **Fuel efficiency** of new Block 9: up to 70%
- ▶ District heating supply secure, as Blocks 3 and 4 to remain in operation until Block 9 is online
- ▶ Immission protection approval to use Block 3 as “**cold reserve**” in winter months



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# OUTLOOK

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# Outlook for 2014/15 financial year

▶ **Sales (excluding energy taxes) to turn out around 10 % lower than the previous year´s figure (Euro 3.7 billion)**



▶ **Operating adjusted EBIT expected to achieve roughly the previous year`s level of Euro 170 million**



▶ **Key drivers of adjusted EBIT forecast:**

- Weather conditions and wind volumes
- Low wholesale electricity prices and ongoing low margin achieved from generating electricity (clean dark spread)
- Commissioning of new plants
- Start-up costs for our growth investments
- Development of waste prices

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# FINANCIAL CALENDAR

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# Financial calendar 2014/15

- ▶ 11 Dec 2014 2013/14 Annual Report
- ▶ 11 Dec 2014 Annual Results Press Conference and Analysts` Conference in Frankfurt/Main
- ▶ 12 Feb 2015 Financial Report for 1<sup>st</sup> Quarter of 2014/15
- ▶ 13 Mar 2015 Annual General Meeting in Mannheim
- ▶ 15 May 2015 Financial Report for 1<sup>st</sup> Half of 2014/15 and Analysts` Conference Call
- ▶ 14 Aug 2015 Financial Report for 1<sup>st</sup> Nine Months of 2014/15 and Analysts` Conference Call
- ▶ 10 Dec 2015 2014/15 Annual Report
- ▶ 10 Dec 2015 Annual Results Press Conference and Analysts` Conference in Frankfurt/Main

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**BACK UP**

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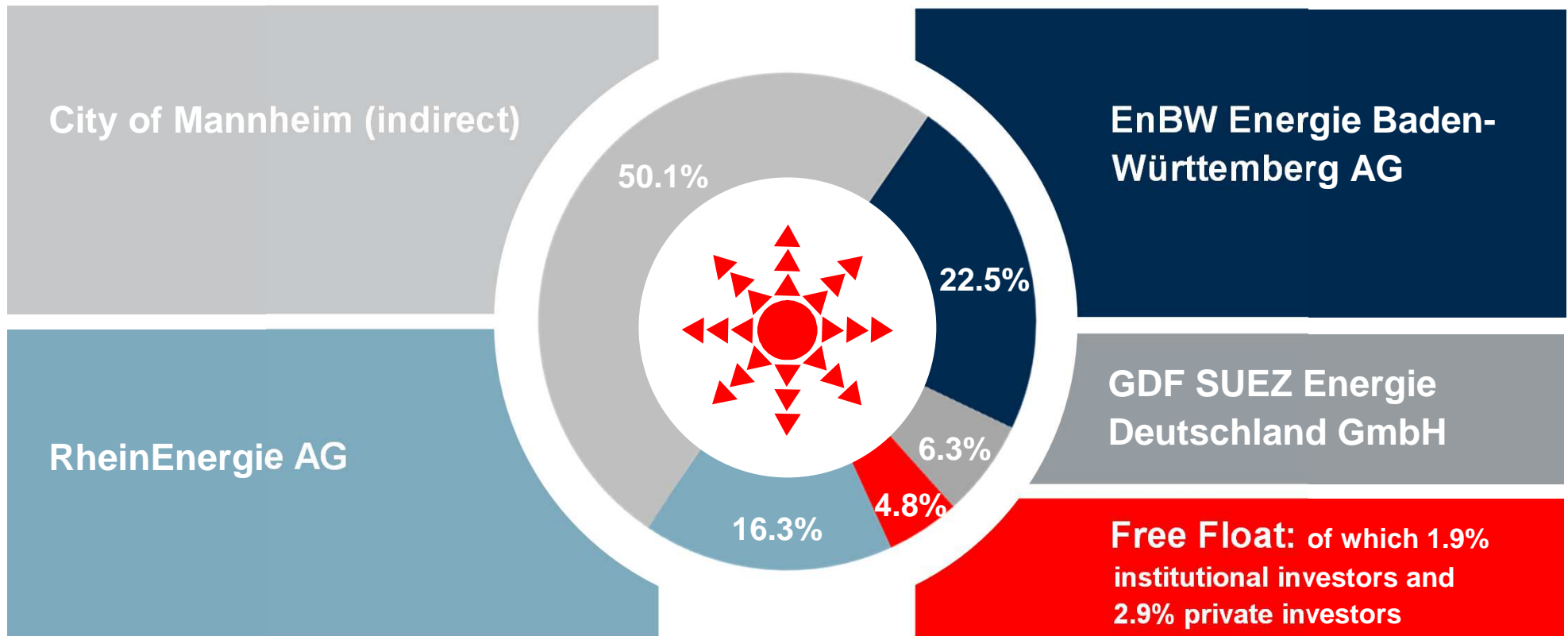
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# THE SHARE OF MVV ENERGIE AG

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# Current shareholder structure and key figures of MVV Energie AG



▶ **No. of shares:**

65.907 million

▶ **Ø daily turnover:**

2,882 shares in 2013/14 FY

▶ **Market capitalisation:**

Euro 1,521 million

(Closing price on 12 May 2015:

Euro 23.07 Euro)

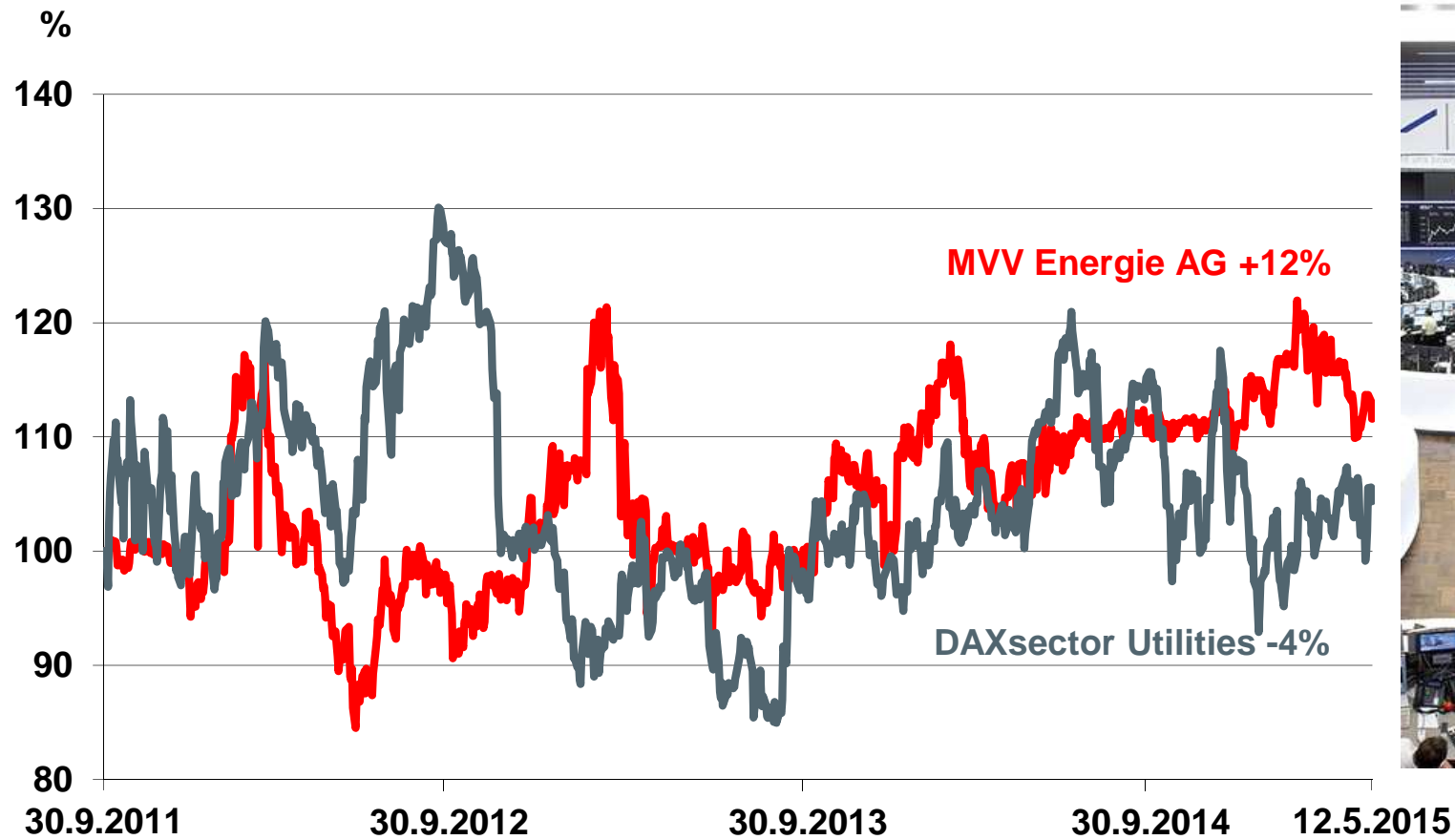
▶ **Free float:**

Euro 73 million

# Performance comparison of the MVV Energie AG share

ISIN DE000A0H52F5

XETRA Trading



Share chart as performance comparison (including dividend payments in March 2012, 2013, 2014 and 2015) with DAXsector Utilities

# High dividend distribution in past eight years

Dividend	2013/14	2012/13	2011/12	2010/11	2009/10	2008/09	2007/08	2006/07
Dividend/Share (Euro)	<b>0.90</b>	0.90	0.90	0.90	0.90	0.90	0.90	0.80
Total dividend <sup>1</sup> (Euro million)	<b>59.3</b>	59.3	59.3	59.3	59.3	59.3	59.3	52.7
Closing price on 30.9 (Euro)	<b>23.89</b>	22.35	21.39	23.86	29.00	30.83	33.20	29.49
Dividend yield <sup>2</sup> (%)	<b>3.8</b>	4.0	4.2	3.8	3.1	2.9	2.7	2.7

<sup>1</sup> with dividend entitlement since FY 2006/07: 65.9 million shares

<sup>2</sup> dividend yield based on respective closing price in XETRA trading on 30 September



# Advantages for our shareholders

## Well balanced portfolio

- ▶ Across major steps of the value added chain,
- ▶ across regions and
- ▶ across customers

## Green & clean

- ▶ No nuclear exposure in own generation
- ▶ Wind onshore, biomass and biomethane
- ▶ CHP and district heating
- ▶ R&D: Smart metering

## Ambitious capex programme in the coming years

- ▶ Euro 3 billion in growth and existing business

## Solid balance sheet

- ▶ Long term investment horizon matched with long term maturities
- ▶ High equity ratio of 35.1%

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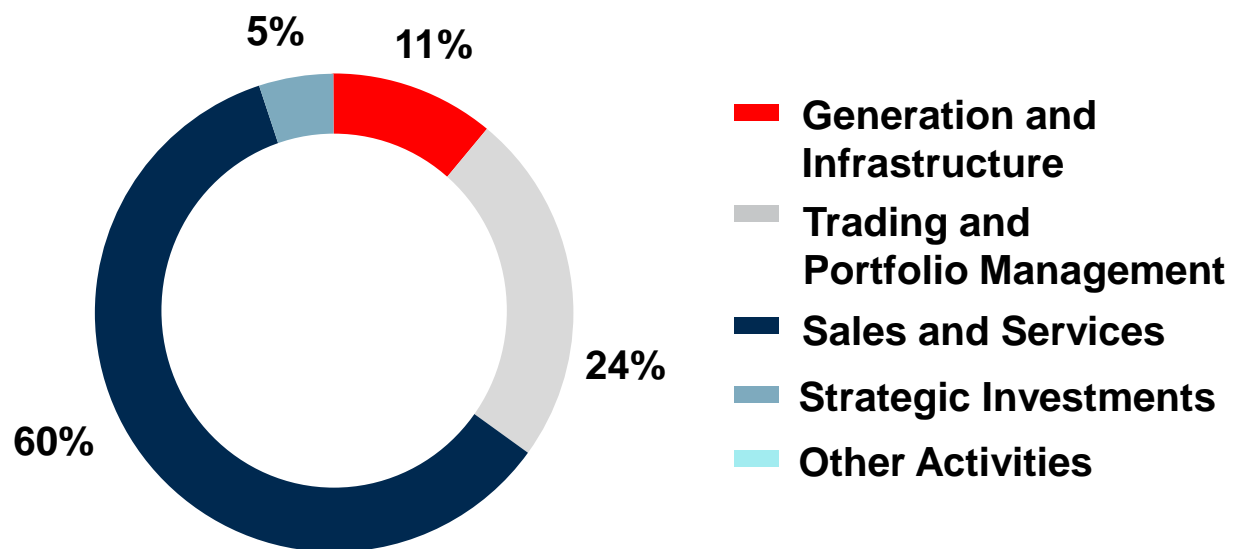
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# ADDITIONAL FINANCIAL INFORMATION

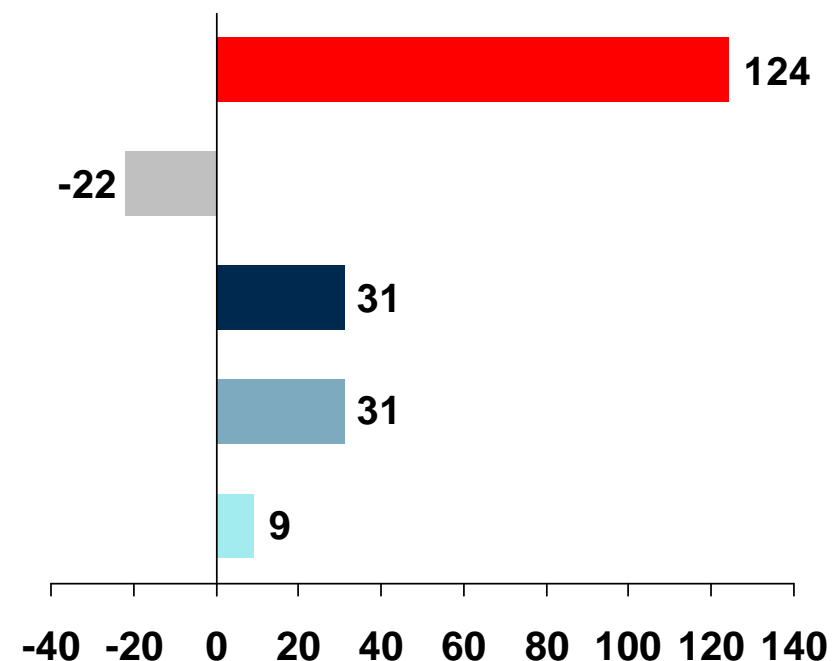
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# Sales and adjusted EBIT by reporting segments

Share of sales in 2013/14 FY



Adjusted EBIT in 2013/14 FY (Euro million)



# External sales and adjusted EBIT performance by quarter

in Euro million	2013/14	2012/13	% change
1 <sup>st</sup> Quarter	1 073	1 082	-1
2 <sup>nd</sup> Quarter	1 030	1 149	-10
3 <sup>rd</sup> Quarter	856	935	-8
4 <sup>th</sup> Quarter	834	878	-5
External sales in the financial year	<u>3 793</u>	<u>4 044</u>	-6
1 <sup>st</sup> Quarter	78	88	-11
2 <sup>nd</sup> Quarter	76	92	-17
3 <sup>rd</sup> Quarter	31	38	-18
4 <sup>th</sup> Quarter	-12	-10	-20
Adjusted EBIT in the financial year	<u>173</u>	<u>208</u>	-17

# Electricity and heating energy turnover in the 2013/14 financial year

	2013/14	2012/13	% change
Electricity in kWh million	<b>23 188</b>	25 817	-10
of which Generation and Infrastructure	<b>142</b>	61	>+100
of which Trading and Portfolio Management	<b>11 950</b>	14 489	-18
of which Sales and Services	<b>10 678</b>	10 733	-1
of which Strategic Investments	<b>418</b>	534	-22
District heating in kWh million	<b>6 497</b>	7 510	-14
of which Generation and Infrastructure	<b>496</b>	402	+23
of which Trading and Portfolio Management	–	–	–
of which Sales and Services	<b>5 076</b>	5 901	-14
of which Strategic Investments	<b>925</b>	1 207	-23

# Gas and water turnover and combustible waste delivered in the 2013/14 financial year

	2013/14	2012/13	% change
Gas in kWh million	<b>23 075</b>	25 078	-8
of which Generation and Infrastructure	<b>103</b>	60	+72
of which Trading and Portfolio Management	<b>15 640</b>	16 313	-4
of which Sales and Services	<b>6 393</b>	7 482	-15
of which Strategic Investments	<b>939</b>	1 223	-23
Water in m <sup>3</sup> million	<b>47.1</b>	47.4	-1
Combustible waste delivered in tonnes 000s	<b>1 865</b>	1 888	-1

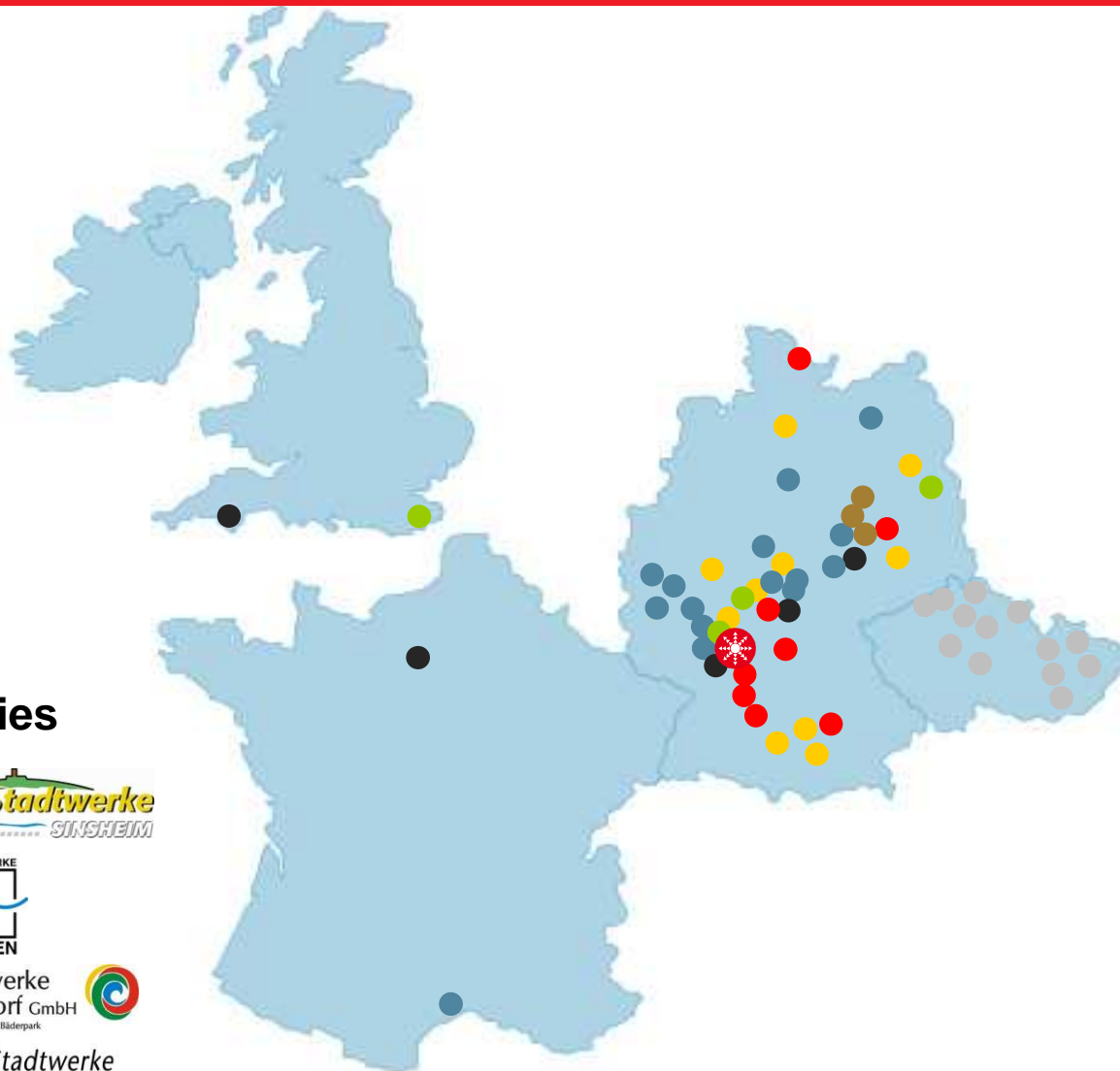
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# INVESTMENTS

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# Municipal utility companies and major locations of the MVV Energie Group



**MVV Energie**  
**● Municipal utilities**

**STADTWERKE KIEL**

**Stadtwerke SINSHEIM**

**EVO**

**STADTWERKE BUCHEN**

**STADTWERKE INGOLSTADT**

**Stadtwerke Walldorf GmbH**  
 Energie · Wasser · Bäderpark

**Köthen Energie**

**Stadtwerke Schwetzingen**

**MVV Energie**  
**Renewable energies**

**● Wind farms and**  
**WINDWÄRTS**

**● Biomethane plants**

**MVV Enamic**

**● Plants and industrial parks**

**MVV Energie CZ**

**● District heating**

**MVV Umwelt**

**● Waste utilisation**

**● Biomass power plants**



# We are making good progress with implementing our growth targets – Examples of projects implemented since MVV 2020



**Successful entry into UK market**



**Development of wind power portfolio**



**Entry into biomethane business**



**Expansion in district heating Block 9 GKM**



**Expansion of district heating in Czech Republic**



**Joint district heating project in Ingolstadt**



**Expansion in energy efficiency and contracting**

# Kirchberg wind farm – successful expansion of wind energy



## Kirchberg location in Rhineland-Palatinate

- ▶ **Launch of operations:** successively from December 2011
- ▶ **Investment:** Euro 84 million
- ▶ Joint venture with juwi
- ▶ 23 E-82 E2 type wind turbines (Enercon)
- ▶ **Hub height:** 138 metres
- ▶ **Output:** 53 MW<sub>e</sub>
- ▶ **Electricity output:** 125 kWh million p.a. (equivalent to consumption of 35,000 households)
- ▶ **CO<sub>2</sub> savings:** 100,000 tonnes a year

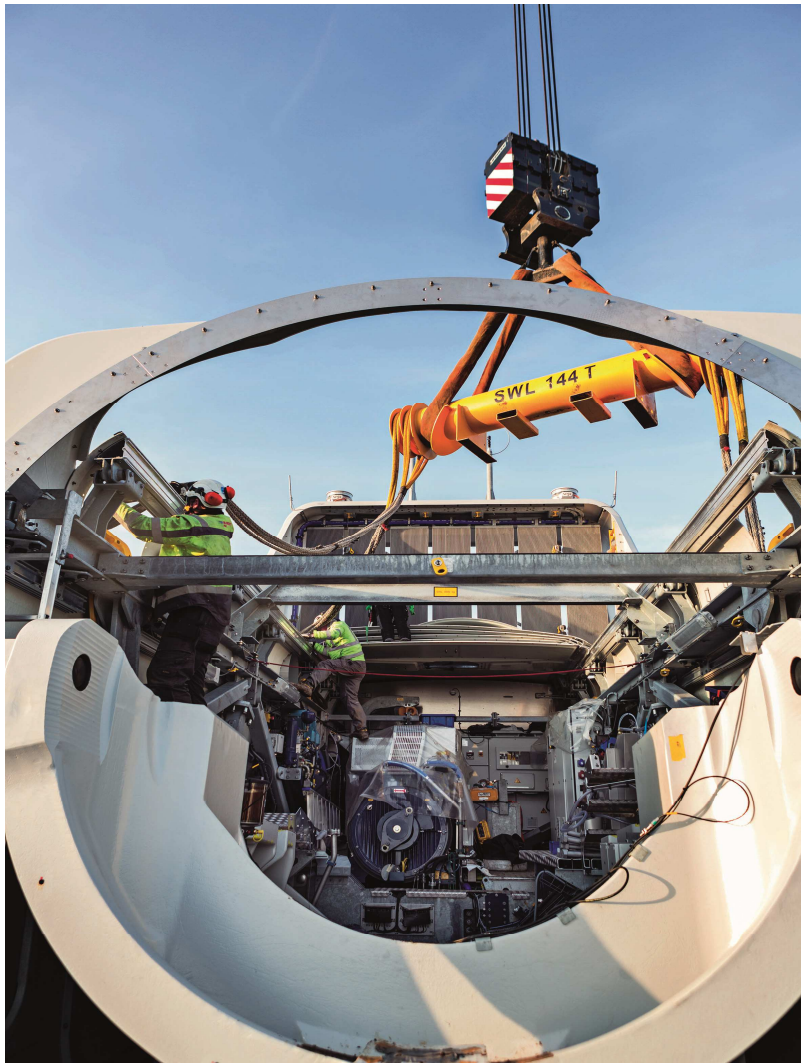
# Acquisition of German onshore wind farm portfolio from Iberdrola



## Wind farm portfolio of Iberdrola

- ▶ **Launch of operations:** 2003 until 2008
- ▶ **Investment:** Euro 53 million
- ▶ **7 locations in 5 federal states**
- ▶ **Total of 40 wind turbines manufactured by GE and Gamesa:** of which
  - 22 MW in 2.0 MW capacity class
  - 37.5 MW in 1.5 MW capacity class
  - 3.4 MW in 0.85 MW capacity class
- ▶ **Output:** 63 MW<sub>e</sub>
- ▶ **Electricity output:** 108 million kWh p.a. (equivalent to consumption of 30,000 households)
- ▶ **CO<sub>2</sub> reduction:** 78,000 tonnes a year

# Wind farm Hungerberg – further expansion of wind energy



## Hungerberg location in Rhineland-Palatinate

- ▶ **Launch of operations:** February 2014
- ▶ **Investment:** Euro 65 million
- ▶ Joint venture with juwi
- ▶ 10 V112 type wind turbines (Vestas)
- ▶ **Hub height:** 140 metres
- ▶ **Output:** 30 MW<sub>e</sub>
- ▶ **Electricity output:** 84 kWh million p.a. (equivalent to consumption of 25,000 households)
- ▶ **CO<sub>2</sub> reduction:** 61,000 tonnes a year

# District heating storage facility at Grosskraftwerk Mannheim (GKM)



## District heating storage facility at GKM

- ▶ **Launch of operations:** Autumn 2013
- ▶ **Investment:** Euro 27 million
- ▶ **Height:** 36 metres
- ▶ **Diameter:** 40 metres
- ▶ **Capacity:** 43,000 cubic metres
- ▶ **Usable heat content:** 1.5 million kWh
- ▶ **Economic ownership and operations management:** MVV Energie
- ▶ **Construction and operation:** GKM

# Launch of biomethane business at Klein Wanzleben location

## Biomethane plant at Klein Wanzleben location

- ▶ **Launch of construction work:** end of May 2011
- ▶ **Launch of operations:** July 2012
- ▶ **Investment:** Euro 12.6 million  
(of which MVV Energie: Euro 9.4 million)
- ▶ **Output:** approx. 3 MW<sub>e</sub>
- ▶ **Biogas production:** 63 million kWh p.a.  
(equivalent to electricity consumption of 6,000 families and heating energy need of 1,200 households)
- ▶ **Gas output:** 695 Nm<sup>3</sup> per hour of biomethane
- ▶ **Raw materials requirement:** approx. 47,500 tonnes p.a. of maize silage, 4,000 tonnes p.a. of sugar beet plus 10,000 tonnes p.a. of sugar beet chips for process heat production (own consumption)
- ▶ **CO<sub>2</sub> savings:** 20,000 tonnes a year
- ▶ **Planned operating term:** at least 20 years



# Biomethane plant Kroppenstedt – second step towards building up a biomethane cluster in Saxony-Anhalt

## Biomethane plant at Kroppenstedt location

- ▶ **Launch of construction work:** December 2012
- ▶ **Launch of operations:** January 2014
- ▶ **Investment:** roughly Euro 14 million
- ▶ **Output:** approx. 3 MW<sub>e</sub>
- ▶ **Biogas production:** 63.5 million kWh p.a.  
(equivalent to electricity consumption of 6,000 families and heating energy need of 1,200 households)
- ▶ **Gas output:** 695 Nm<sup>3</sup> per hour of biomethane  
(in natural gas quality)
- ▶ **Raw materials requirement:** approx. 68,500 tonnes p.a., mainly cow slurry/cow dung, maize silage and sugar beet
- ▶ **CO<sub>2</sub> savings:** 20,000 tonnes a year
- ▶ **Planned operating term:** 26 years



# Decentralised energy supply – EVO wood pellet plant in Offenbach



## Wood pellet plant in Offenbach

- ▶ **Launch of operations:** May 2011
- ▶ **Investment in wood pellet plant, including adjacent biomass cogeneration plant:**  
approx. Euro 17 million
- ▶ Wood pellet production from shavings and waste timber in 2013/14 FY: 56,000 tonnes
- ▶ Wood pellet production will be expanded to 90,000 tonnes p.a.
- ▶ Substitute fuel for up to 50,000 tonnes of hard coal at EVO's cogeneration plant
- ▶ **CO<sub>2</sub> savings:** up to 80,000 tonnes p.a.



# Implementation: Successful expansion of district heating – Ingolstadt



## Ingolstadt joint district heating project

- ▶ **Launch of operations:** summer 2011
- ▶ Bavaria's largest waste heat and district heating project
- ▶ **Investment:** around Euro 23 million
- ▶ Joint project with Petroplus refinery, City of Ingolstadt and AUDI AG
- ▶ Construction of a 5.3 km district heating pipeline
- ▶ **Thermal energy output:** 300 million kWh p.a.

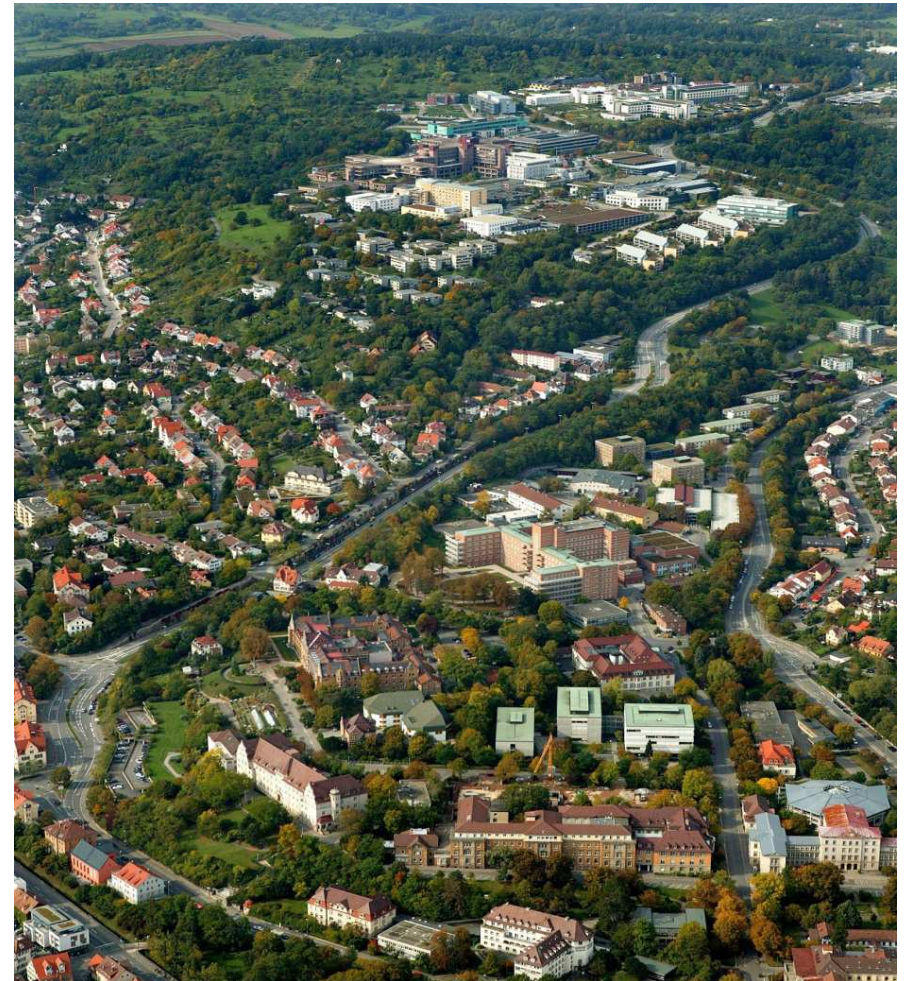
# Enhanced energy efficiency and contracting – Tübingen University Hospital

## Tübingen University Hospital

- ▶ **Assumption of operations:** July 2010
- ▶ Conversion of 40 year-old heat power plant from oil and gas to wood pellet operations
- ▶ **Launch of operations:** March 2013
- ▶ **Investments:** Euro 12 million
- ▶ **Contractual term:** 20 years

### Technical data

- ▶ **2 wood boilers:** each 10 MW<sub>t</sub>
- ▶ **Peak load boiler:** 17 MW<sub>t</sub> + reserve boiler 32 MW<sub>t</sub>
- ▶ **CO<sub>2</sub> savings:** 20,000 tonnes a year, or up to 98%



# TERMIZO – Heating energy from waste

## TERMIZO in the Czech Republic

- ▶ TERMIZO is a waste-fired heating energy plant that meets the highest European standards
- ▶ **Purchase price:** approx. Euro 21 million
- ▶ All of the heating energy produced is supplied to Teplarna Liberec
- ▶ Single-line plant concept with modern flue gas cleaning



## Technical data

- ▶ **Thermal energy output:** 38.3 MW<sub>t</sub>
- ▶ **Electricity generation:** 4.0 MW<sub>e</sub>
- ▶ **Waste incineration capacity:** 106,000 tonnes p.a.

# The Clean Dark Spread (CDS) development has a significant impact on the MVV Energie Group



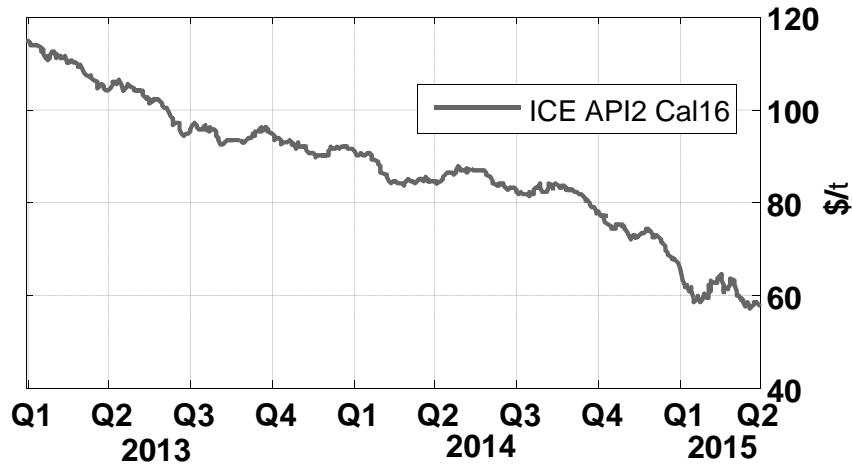
Future CDS development will be influenced by different markets and political decisions:

## German power generation

- Nuclear exit
  - Renewable generation (wind, solar)
  - New conventional generation
- ▶ Global coal markets/FX
- ▶ Carbon price level

# Energy price curves

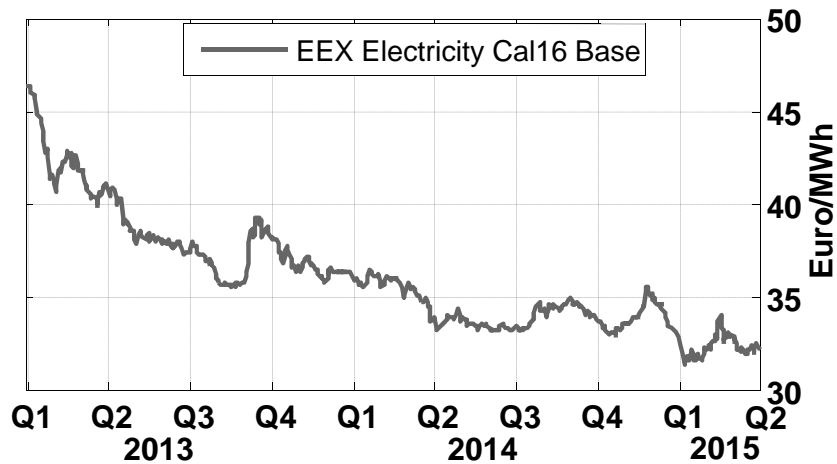
## Coal



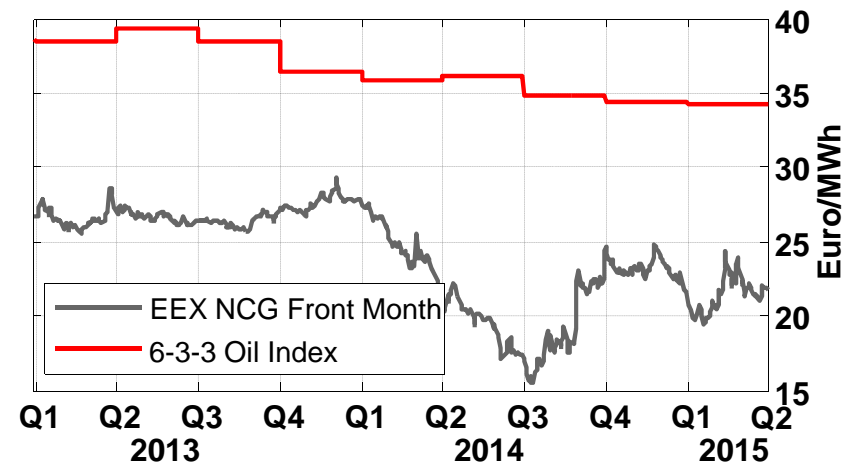
## CO<sub>2</sub>



## Electricity



## Gas



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