

Zero-carbon city: the nearest prospect or a distant future?

Developments in the Berlin electricity network

REENCON, Moscow, Russian Federation

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Content

1

Energiewende in Berlin

2

Integration of centralized and decentralized systems in Berlin

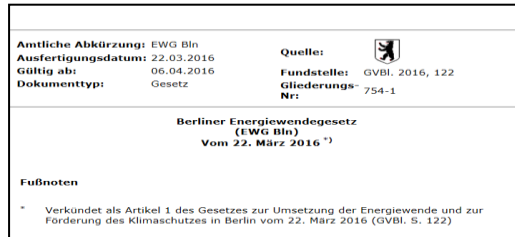
Political frame in Berlin

2011 energy concept



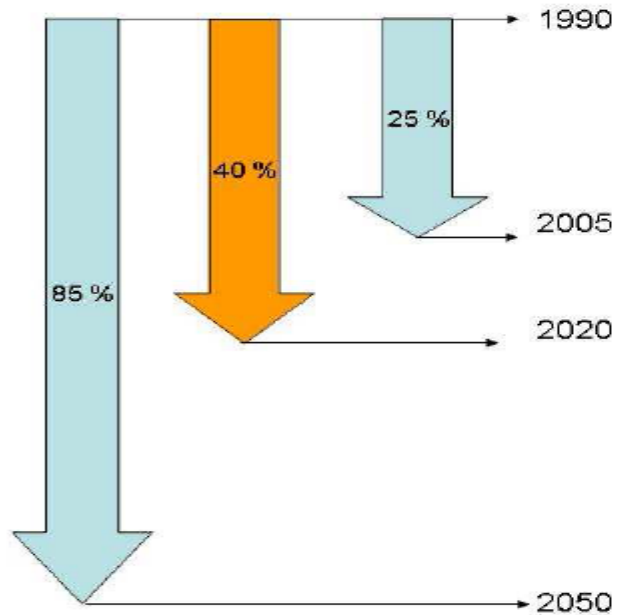
efficient – renewable – sustainable
until 2020

2016 Energiewende law



save – costefficient – sustainable
until 2050

Berlin Climate goals: minus 40 % CO₂ until 2020



Basis: 29,3 Mio. t CO₂
8,6 t CO₂ per capita

achieved 21,9 Mio. t CO₂
6.4 t CO₂ per capita

Ziel: 17,6 Mio. t CO₂
5,2 t CO₂ per capita

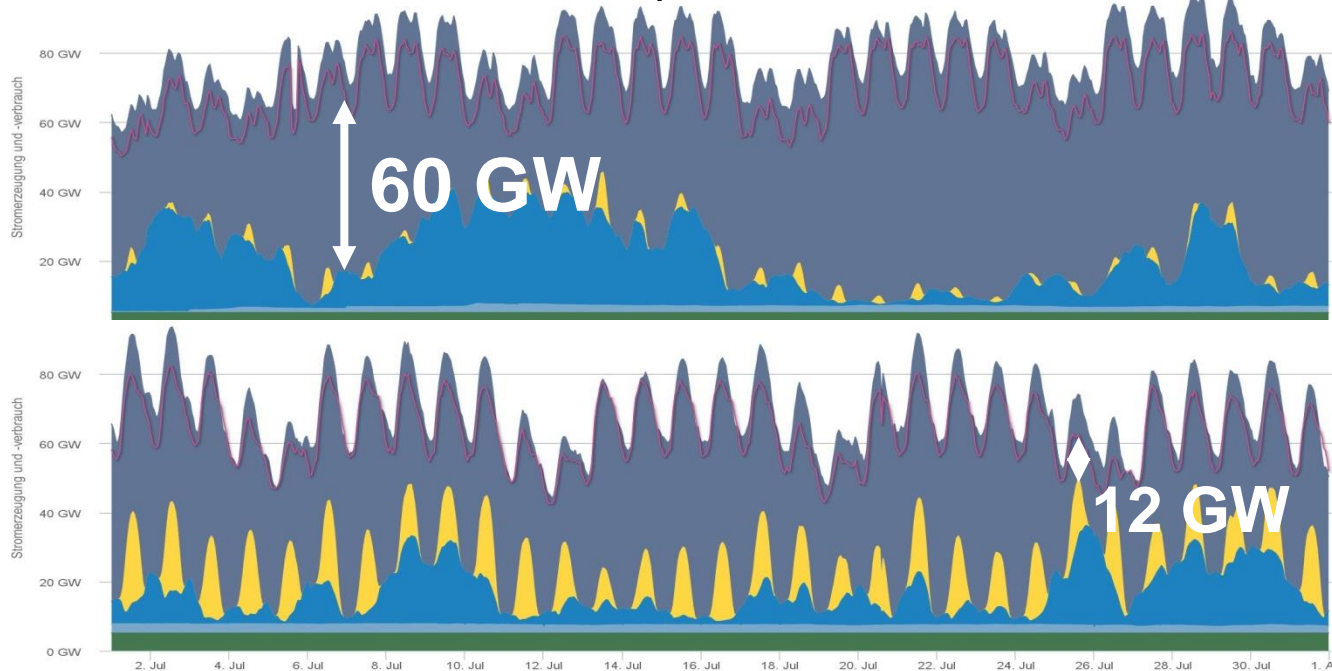
Ziel: 4,4 Mio. t CO₂
1,3 t CO₂ per capita

Energiewende = the Vision mainly to switch to renewable energies



What has changed in the generation system? (1/2)

- New term: Residual-Load = Consumption Load – Renewable Generation Load



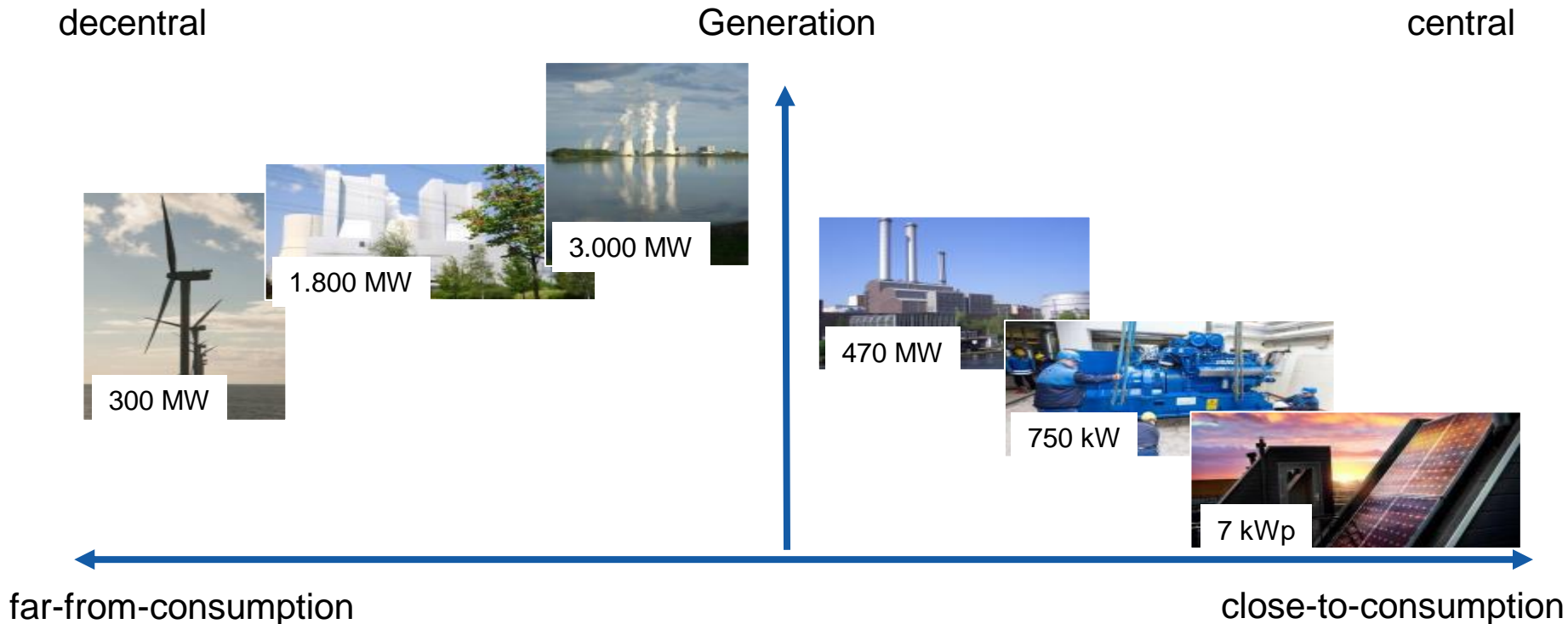
January 2015

July 2015

source: [Agorameter](#), 2015

● Konv. Kraftwerke ● Solar ● Wind ● Laufwasser ● Biomasse — Stromverbrauch ● Steinkohle ● Braunkohle ● Kernenergie ● Pumpspeicher und Speicherwasser

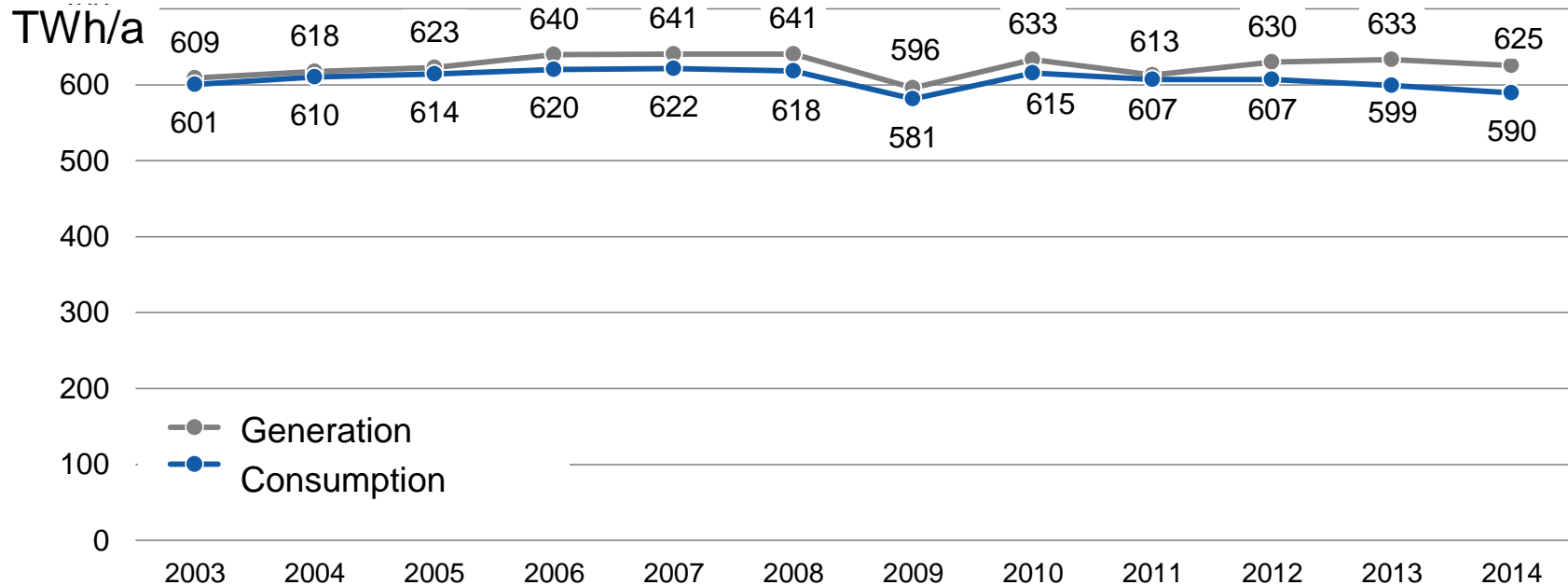
What has changed in the generation system? (2/2)



source: Fotos [Pressemappe](#), November 2015

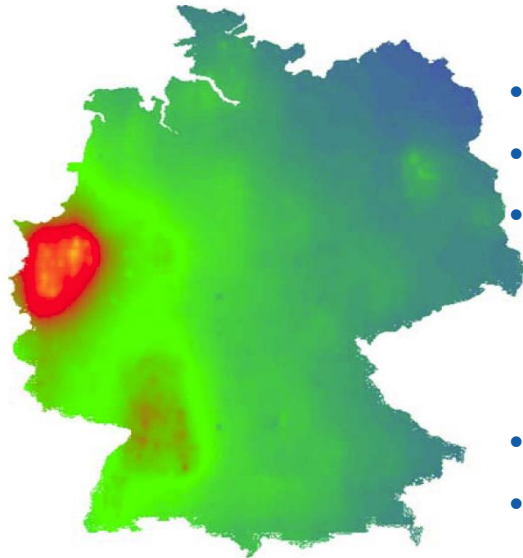
What has changed in the consumption system? (1/2)

- Domestic consumption (gross production - balance exchange) has recently been "declining"
Furthermore high gross production, exchange balance with neighboring countries grew to approx. 35 TWh / a



source: BMWi, AG Energiebilanzen e.V., Bruttostromerzeugung in Deutschland von 1990 bis 2014 nach Energieträgern, Stand 03.08.2015

What has changed in the consumption system? (2/2)

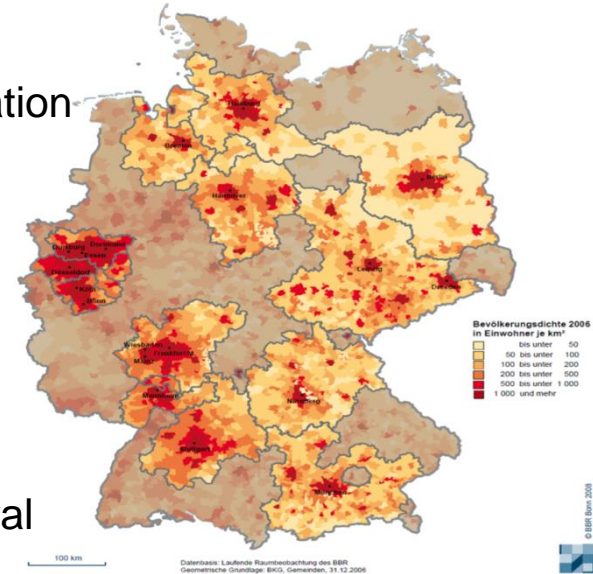


Metropolitan Regions

- 58 Mio. inhabitants = 70% der population
- Consumption > Generation
- therefore energy imports and central consumption

Rural Regions

- Consumption < Generation
- therefore energy exports and decentral consumption



Actually nothing: consumption in the West and South of industry and households

source: 3. Fachforum Netze, G. Scheibner, 50Hertz Transmission GmbH Berlin, Stand 13.03.2013

Content

1

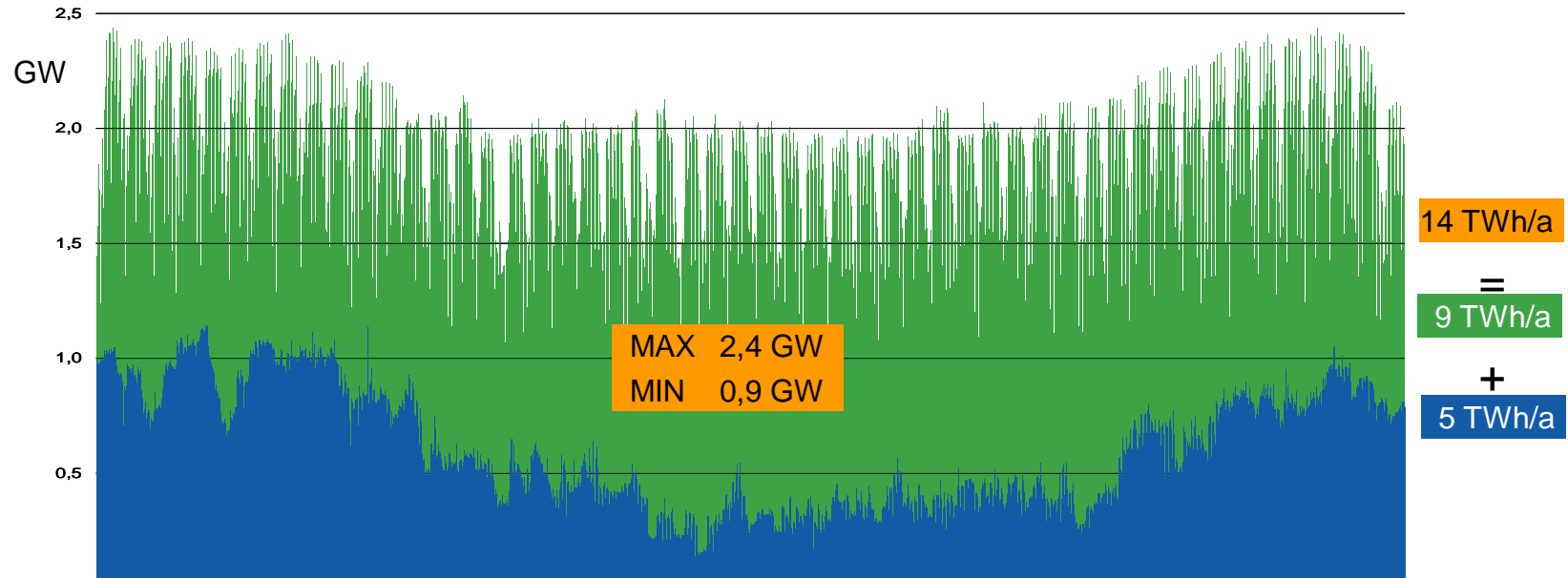
Energiewende in Berlin

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Integration of centralized and decentralized systems in Berlin

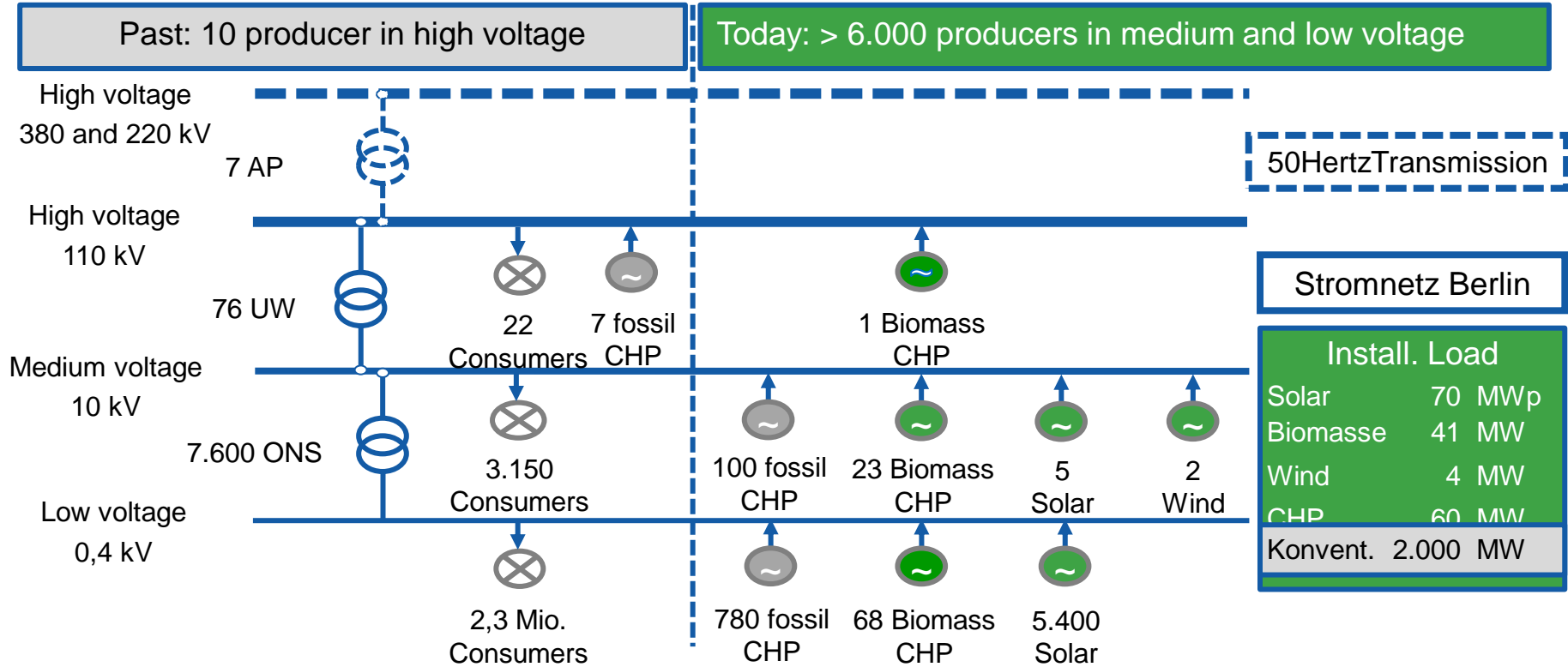
Where does energy consumed in Berlin come from?

- Close to consumption generated from urban CHP as well as biomass, solar and wind
- Far from consumers generated and imported from the transmission network, much renewable



source: Zeitreihen von Netzlast, Bezug ÜNB und Netzeinspeisung, VE Distribution Berlin DD-GCH4, KJ 2011

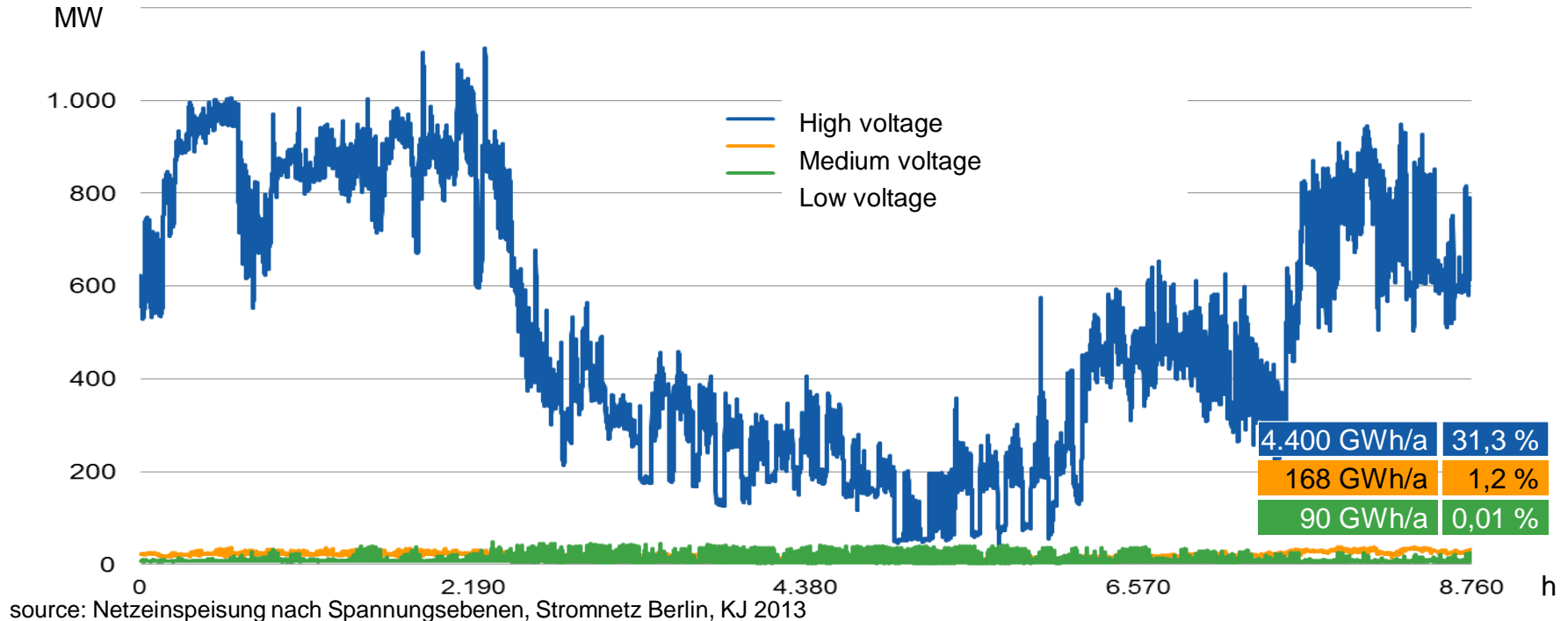
Where is the close-to-consumption, central production integrated?



source: Stromnetz Berlin, Quartalsbericht Netzvertrieb vom 21.01.2015, Stand Dez. 2014

What is the close-to-consumption production?

- Time series of feeds according to voltage levels and energy input



How is the far from consumption and decentralized generation integrated?

- Through well developed transmission and distribution networks



source: Stromnetz Berlin

For discussion

- Market players are looking for their best business performance.
- Incentive-compatible legal framework can bring together energy / climate targets and market actors.
- "Open discussion" about energy policy triangle necessary.

Thank you for your attention.

Disclaimer:

All statements refer exclusively to the views of the author and do not necessarily represent the view of Stromnetz Berlin GmbH or Vattenfall. The slides are the result of continuous energy-economic discussions and can have an incomplete effect without oral explanations.

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