



Energiewende 2.0 – David meets Goliath

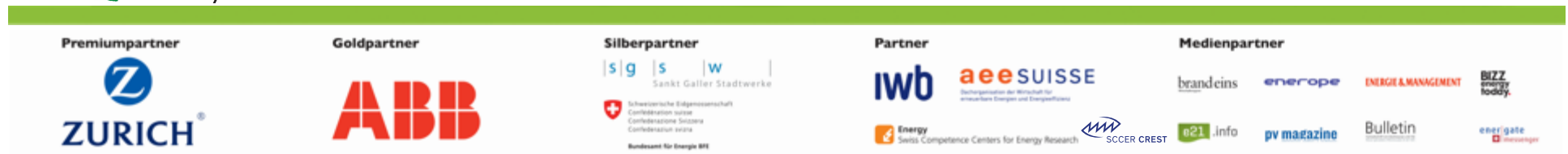
Introduction to the Conference Theme

Prof. Dr. Rolf Wüstenhagen

Good Energies Chair for
Management of Renewable Energies



University of St.Gallen



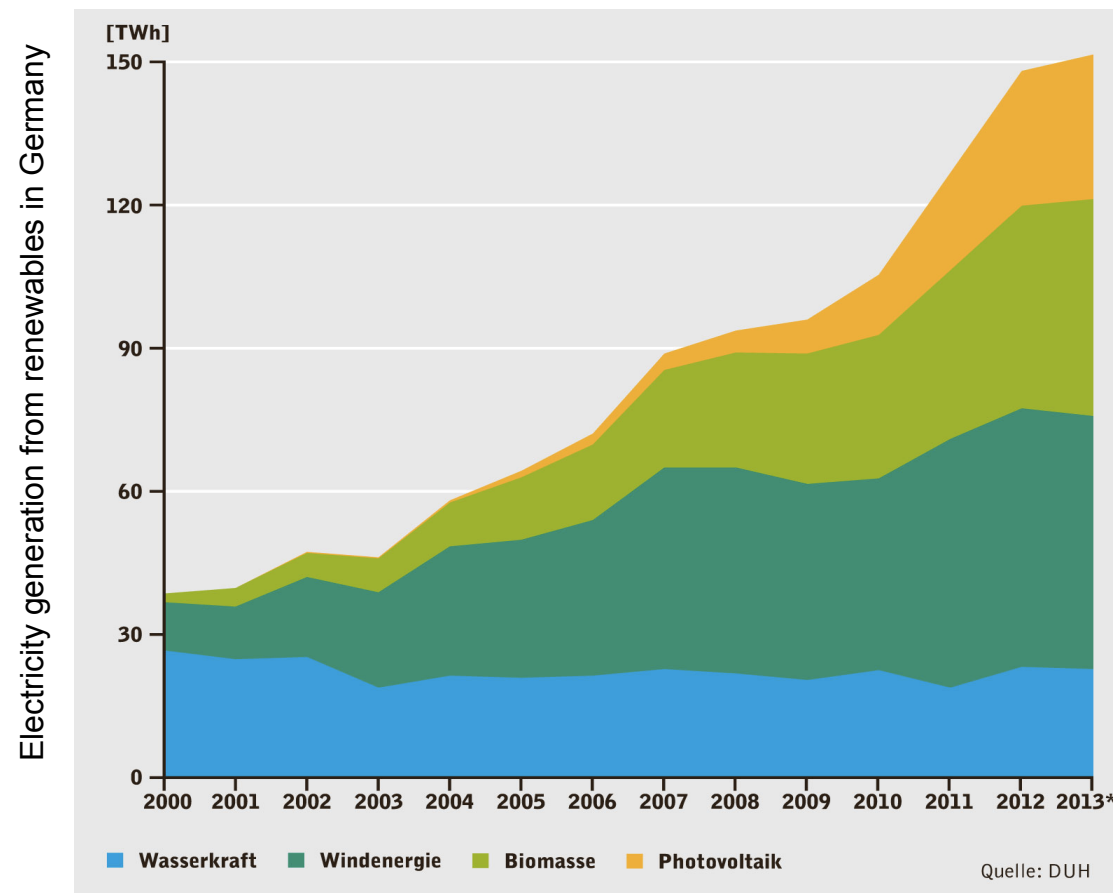
Outline

- 1. Energiewende 1.0 versus Energiewende 2.0**
- 2. Five Propositions**
- 3. Conclusions**

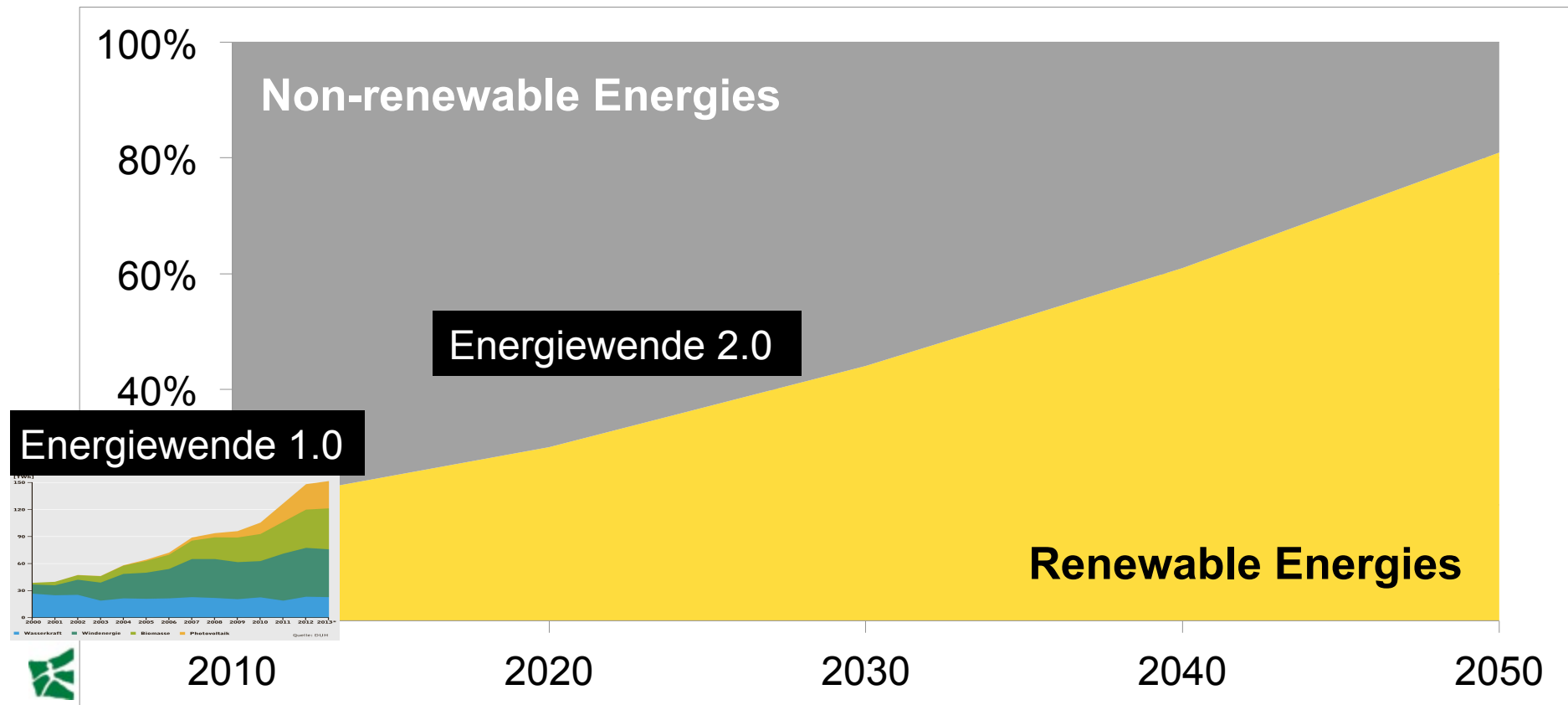
**A warm welcome to all of you –
in particular to REM-HSG executive class of 2015**



Energiewende 1.0: Renewables going mainstream...



...but there is a long way to go
on the road from 20:80 to 80:20



Energiewende 1.0: What has been achieved so far?

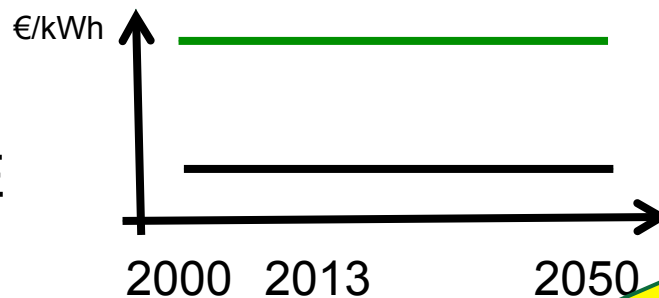
- Significant capacity expansion of renewables in some countries (e.g: Germany 25 %, Italy 35 % of power demand)
- Initial steps taken in several countries
- Progress made: electricity > heat > transport
- Significant cost reductions for some technologies (especially PV, wind), less so for others (geothermal, biomass, CSP, ...)
- General socio-political acceptance high, specific projects and policies often facing challenges
- Vivid political debate on speed and “cost of Energiewende”

Speed limit or minimum speed for “Energiewende”?

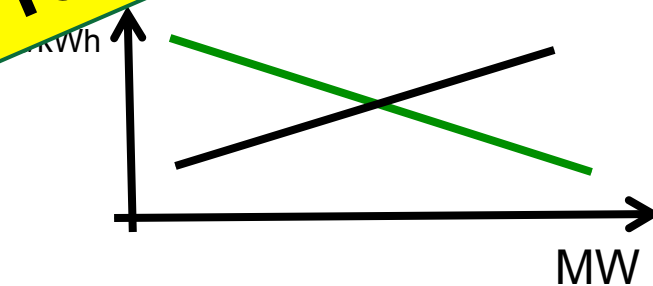
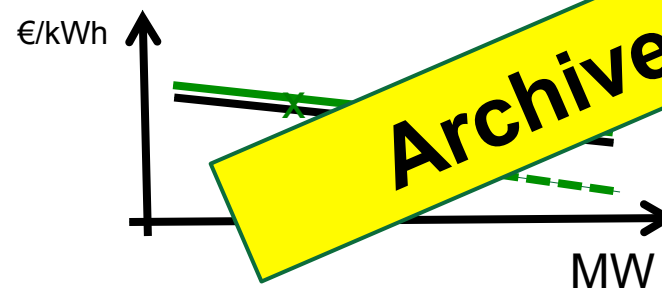
Slow is beautiful 

Fast is beautiful 

Relative
Prices
RE/non-RE



Learning
Curve



Causality of
Learning Curves

Research & Development

Learning by doing

Archive 2013

Evolution of renewable energy policies & markets

Energiewende 1.0

- RE = more expensive
- Attractive returns to overcome investor inertia
- Minimizing risk
- Creating competition within existing market design
- Marginal changes to non-RE
- RE = icing on the cake

Energiewende 2.0

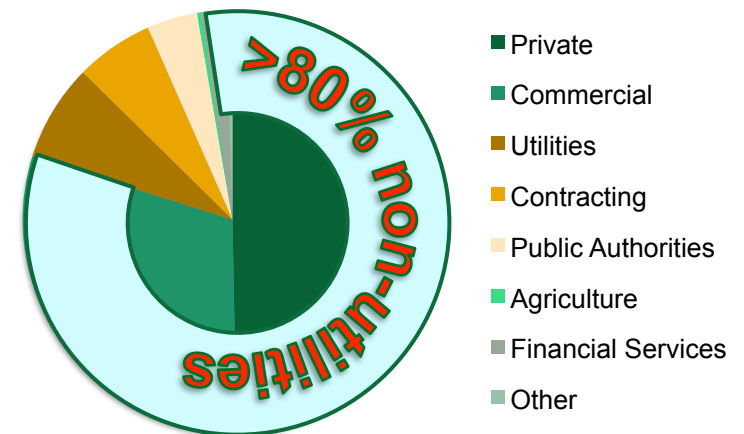
- RE = nearly competitive
- Adequate returns to compensate for risk
- Allocating risk to where it's best managed
- Redesign market elements in light of RE characteristics
- Phasing out some non-RE
- RE = the cake



David meets Goliath



Energiewende 1.0 has led to an inflow of new investors



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Proposition 1:

A moderate “Energiewende” faces broad public support

Canton St. Gallen:

Increasing financial support for renewables by...

...factor 2

70%

...factor 20

31%

Canton Neuchâtel:

Planning zones for wind power development

68%

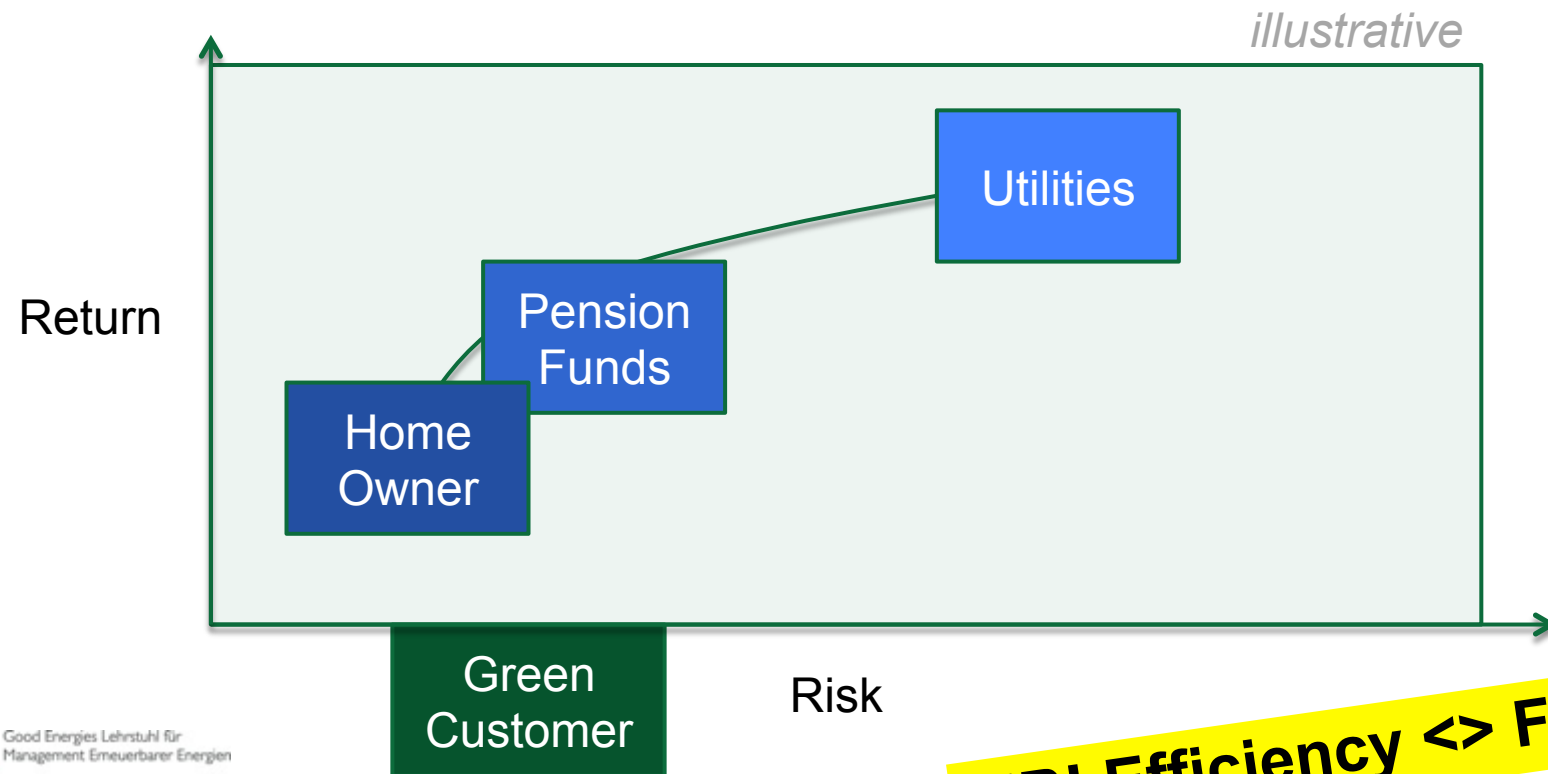
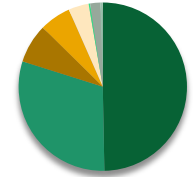
Mandatory referendum for each project

37%



Proposition 2:

Investor segmentation can inform policy design

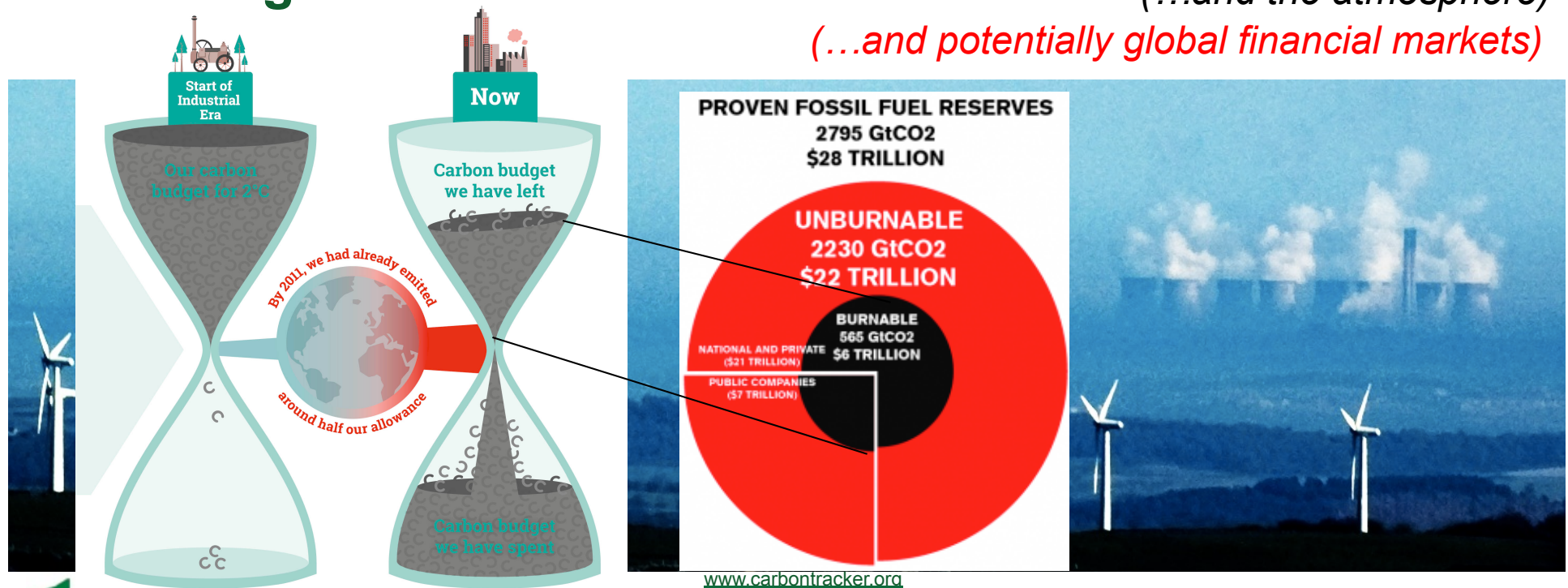


NB! Efficiency $\leftrightarrow$ Fairness

Proposition 3:

Renewable phase-in without carbon phase-out challenges the business case for both

(...and the atmosphere)
(...and potentially global financial markets)



Source: University of Cambridge, Program for Sustainability and Leadership

www.carbontracker.org

www.forbes.com/sites/ashoka/2013/07/29/

[divesting-from-fossil-fuels-means-a-cleaner-safer-and-more-resilient-future/](#)

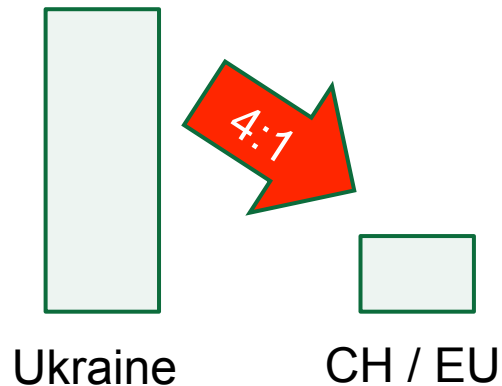
Proposition 4: (e-)Mobility is key for overcoming carbon lock-in



Proposition 5:

Energy Security 1x1 – investing in renewables and energy efficiency creates a double dividend

Energy Intensity of GDP



Energy Import Dependence



Europa ist auf die Erdgasexporte Russlands angewiesen. Die EU will nun die Abhängigkeit verringern. Doch weder Fracking noch Importe aus den USA sind für den Energieexperten Rolf Wüstenhagen Lösungen.

Mehr Energieeffizienz – weniger Putin

DAVID SCARANO

nicht spurlos vorüber. Seit damals von will in den nächsten zwei Jahren

Im Kalten Krieg nicht der Bedrohung hat Europa den Gasimport aus Russ



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Conclusions: Towards Energiewende 2.0

- Energiewende 1.0 has kick-started a dynamic global development of renewable energy markets
- The next stage of development (“Energiewende 2.0”) should build on the existing dynamics and...
 1. ...leverage broad-party consensus & consumer preferences
 2. ...tailor policies to investor-specific risk-return profiles
 3. ...address carbon phase-out
 4. ...tackle opportunities and challenges in transportation
 5. ...reap the double dividend of energy security
- **Disclaimer: Academics tend to think ahead. This is not an investment recommendation with guaranteed returns tomorrow.**

Thank you for your attention!



**Executive Diploma Programme
Renewable Energy Management**
<http://www.es.unisg.ch/rem>

