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Swiss Federal Office of Energy SFOE

## Energy Strategy 2050 and the Role of Life Cycle Assessments in the Electricity Sector

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## In the next 25 minutes you will hear about...

- **Switzerland's Energy Strategy 2050**
  - Objectives
  - Challenges
  - Basic principles
  - Key elements
  - Timetable
- **Electricity supply and demand in the ES2050**
  - Different scenarios
  - Transparent LCA information as prerequisite for the decision making process
  - Promotion of renewable electricity production
- **LCA information for electricity customers**
  - Bridging the gap between supply and demand: tracking, disclosure and Guarantees of Origin
  - Options for showing environmental impact of electricity consumption



## Energy Strategy 2050: objectives





## The challenges

- **Population growth:** Energy for more and more people
- **Infrastructure:** Power plants and networks are decades old and need to be replaced and expanded, regardless of the new energy strategy
- **Supply security:** Switzerland's integration into international cooperation mechanisms helps secure the supply of electricity, gas and oil
- **Pricing and market:** Tendency towards higher energy prices, securing free supplier choice, maintaining international competitiveness of Swiss companies
- **Climate change:** CO<sub>2</sub> emissions under control, climate change impact on domestic energy production (hydropower) after 2050
- **Environment, nature, landscape**
- **Plus a new challenge:** Post-Fukushima.  
This all has to be achieved while Switzerland simultaneously withdraws from nuclear energy on a step-by-step basis!



## Basic principles

- **Federal government specifies framework conditions** in accordance with Article 89 of the Federal Constitution.
- Energy industry is responsible for **energy supply security** (Energy Act, Article 4, paragraph 2).
- On 25.5.2011, Federal Council announces decision to withdraw from nuclear energy.
- Parliament adopts this resolution.
- SFOE is mandated to develop a new energy strategy.







## Key elements of the Energy Strategy 2050 (1/2)

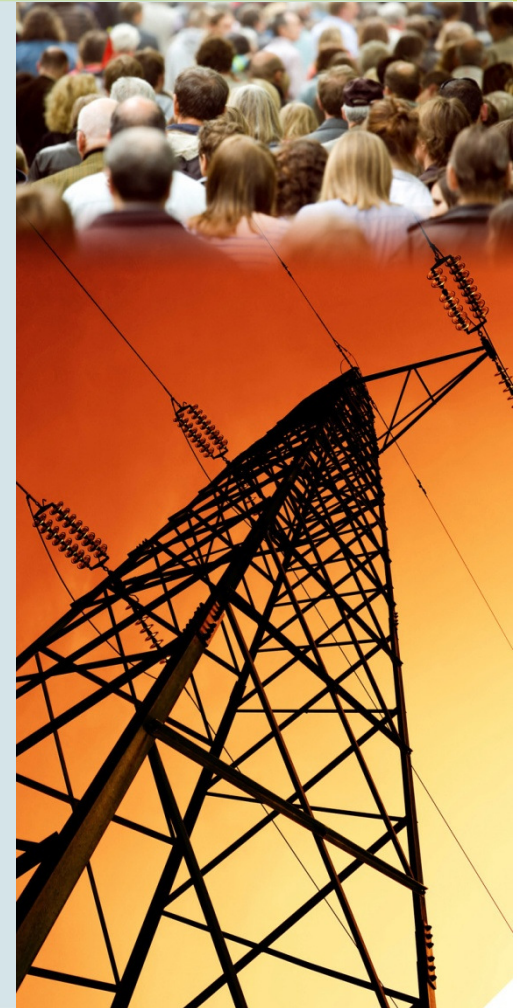
1. Enhance energy efficiency
2. Develop renewable energy production
  - Hydropower: + 3.2 TWh  
(+ pump storage for integration of new renewable energies)
  - New renewable energy: Unlocking sustainable potentials (24.2 TWh)
3. Meet residual demand through:
  - Electricity production with fossil fuels (combined heat and power, gas and steam turbines)
  - Electricity Imports





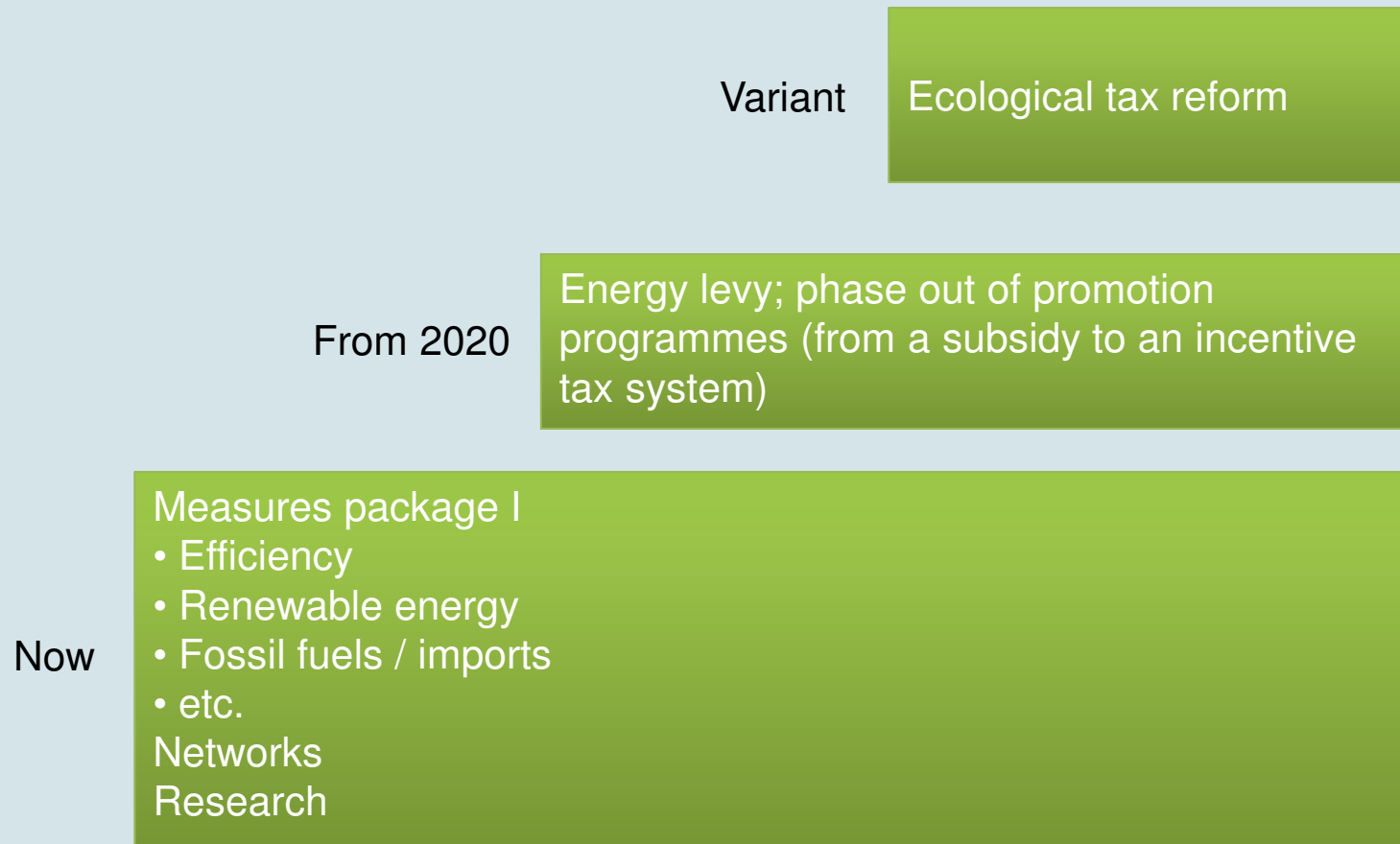
## Key elements of the Energy Strategy 2050 (2/2)

4. Electricity Networks
  - Expansion and renovation
  - Renovation of distribution grid in direction of smart grids
5. Strengthening energy research
6. Confederation sets the example
7. Encouraging international cooperation in the field of energy





## Energy Strategy 2050: next steps







# Energy Strategy 2050: current timetable

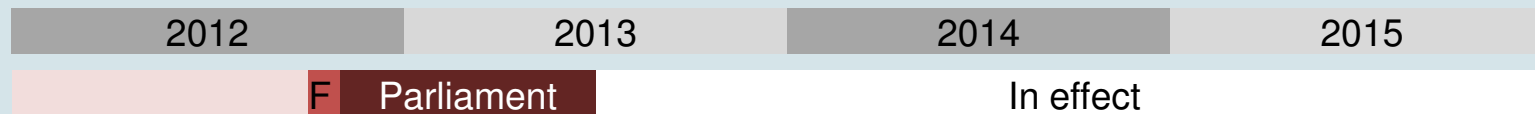
## Energy Strategy 2050: Measures package I



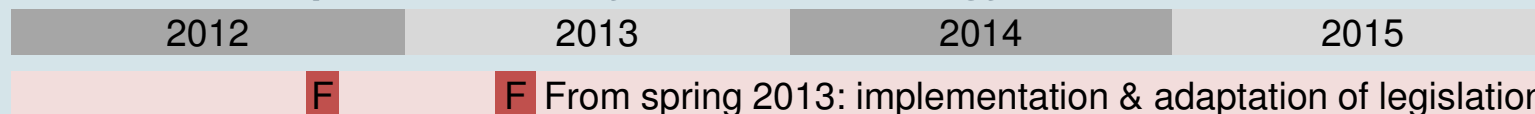
## Parl. init. 12.400 (higher feed-in rem. fee, relief for large consumers)



## Swiss coordinated energy research action plan



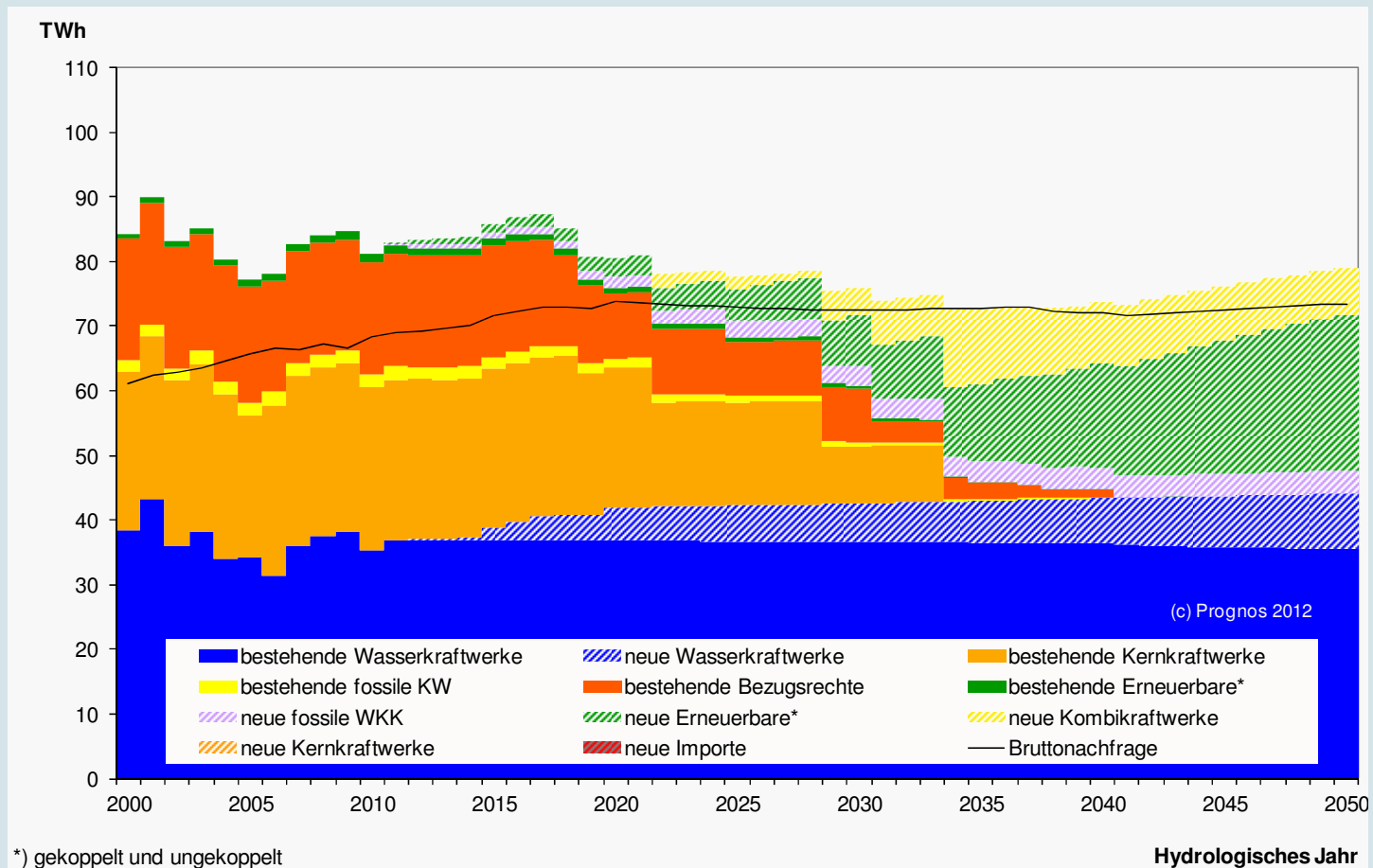
## Detailed concept for electricity networks strategy



Key: F = Federal Council; C = Consultation; Opt. ref. = optional referendum



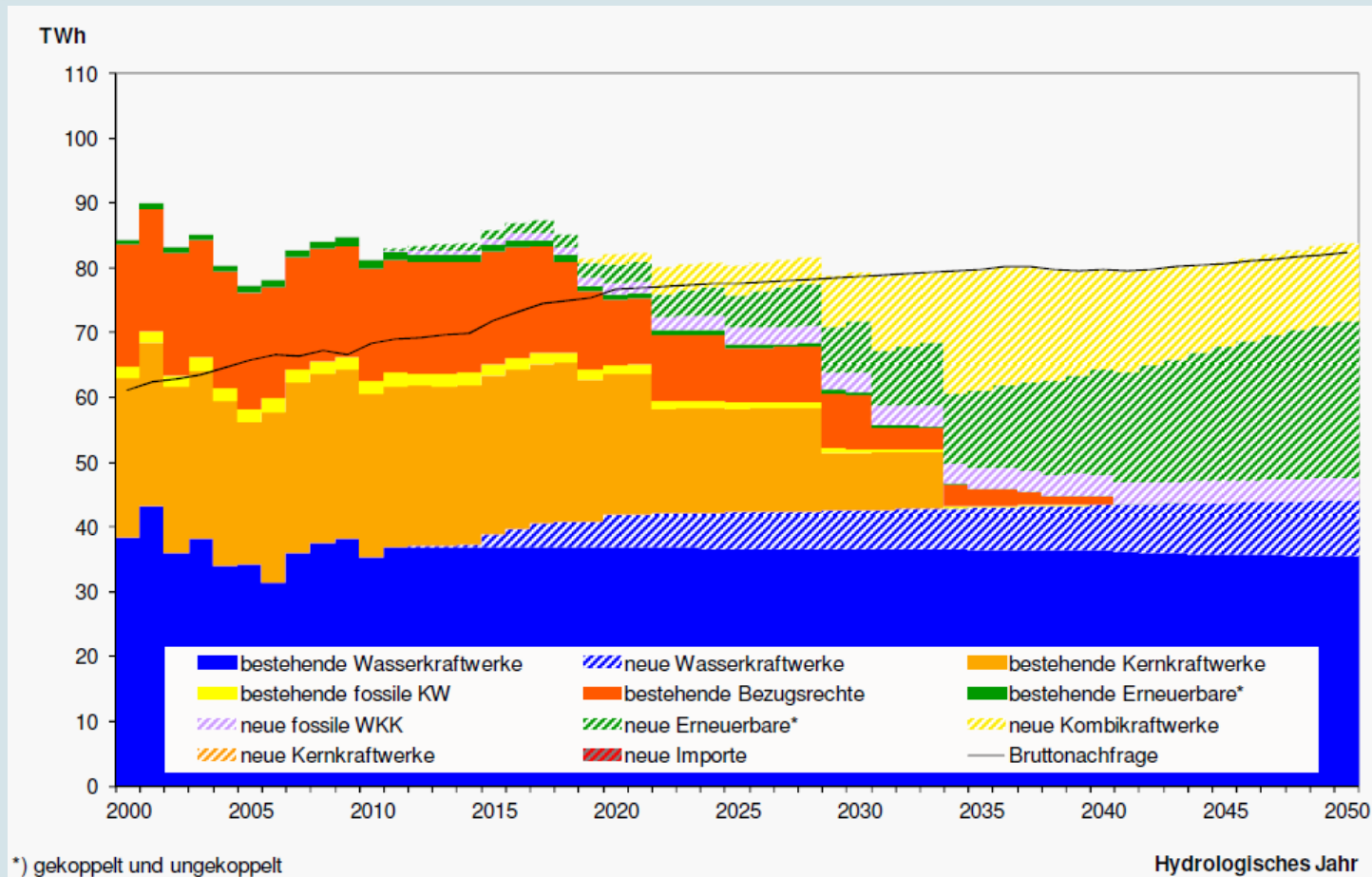
## Different scenarios for supply and demand of electricity are examined (1/3)



Electricity supply scenario, political measures, variant combined cycle and renewable (C&E)



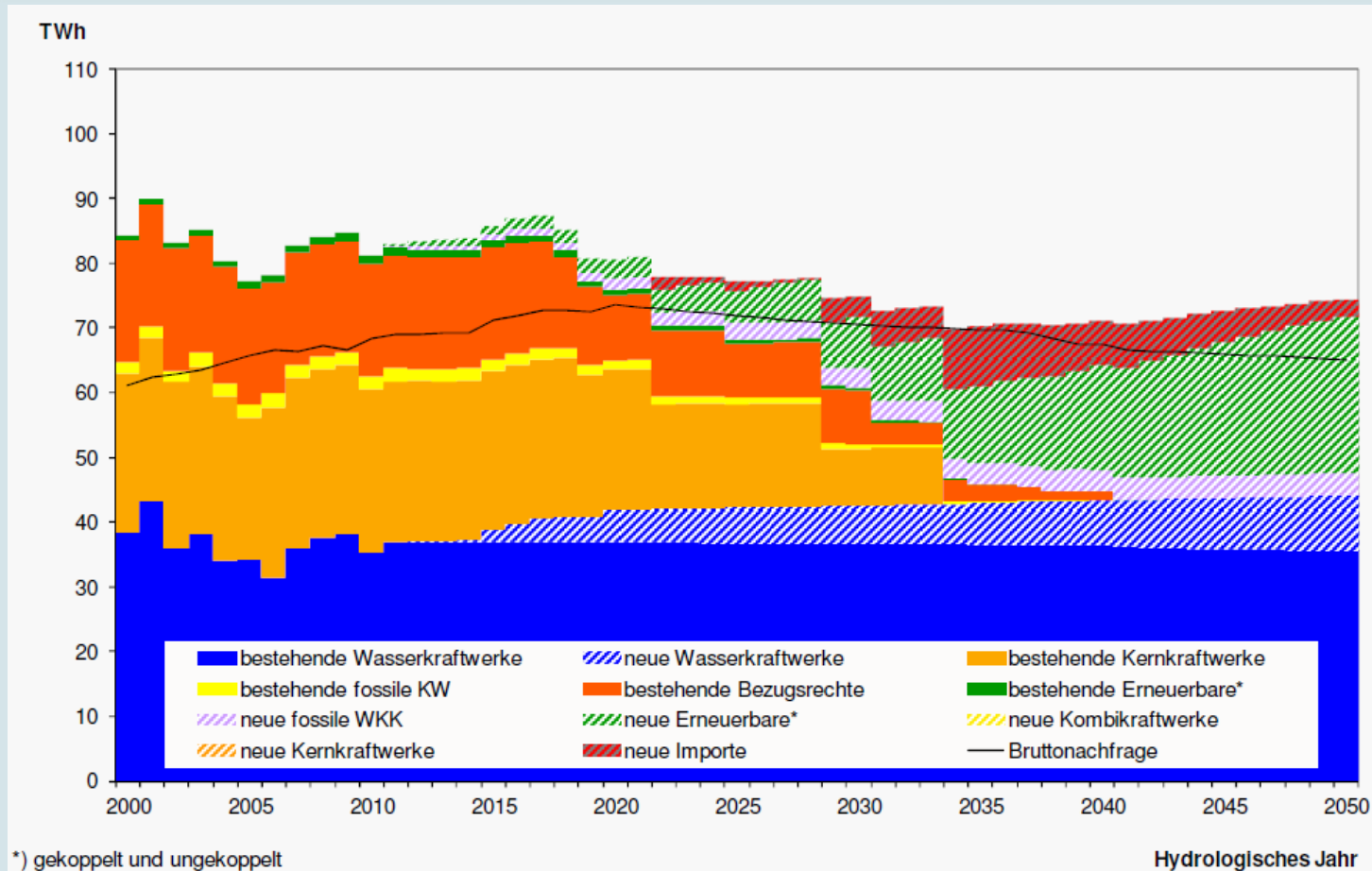
## Different scenarios for supply and demand of electricity are examined (2/3)



Electricity supply scenario, business as usual, variant combined cycle and renewable (C&E)



## Different scenarios for supply and demand of electricity are examined (3/3)

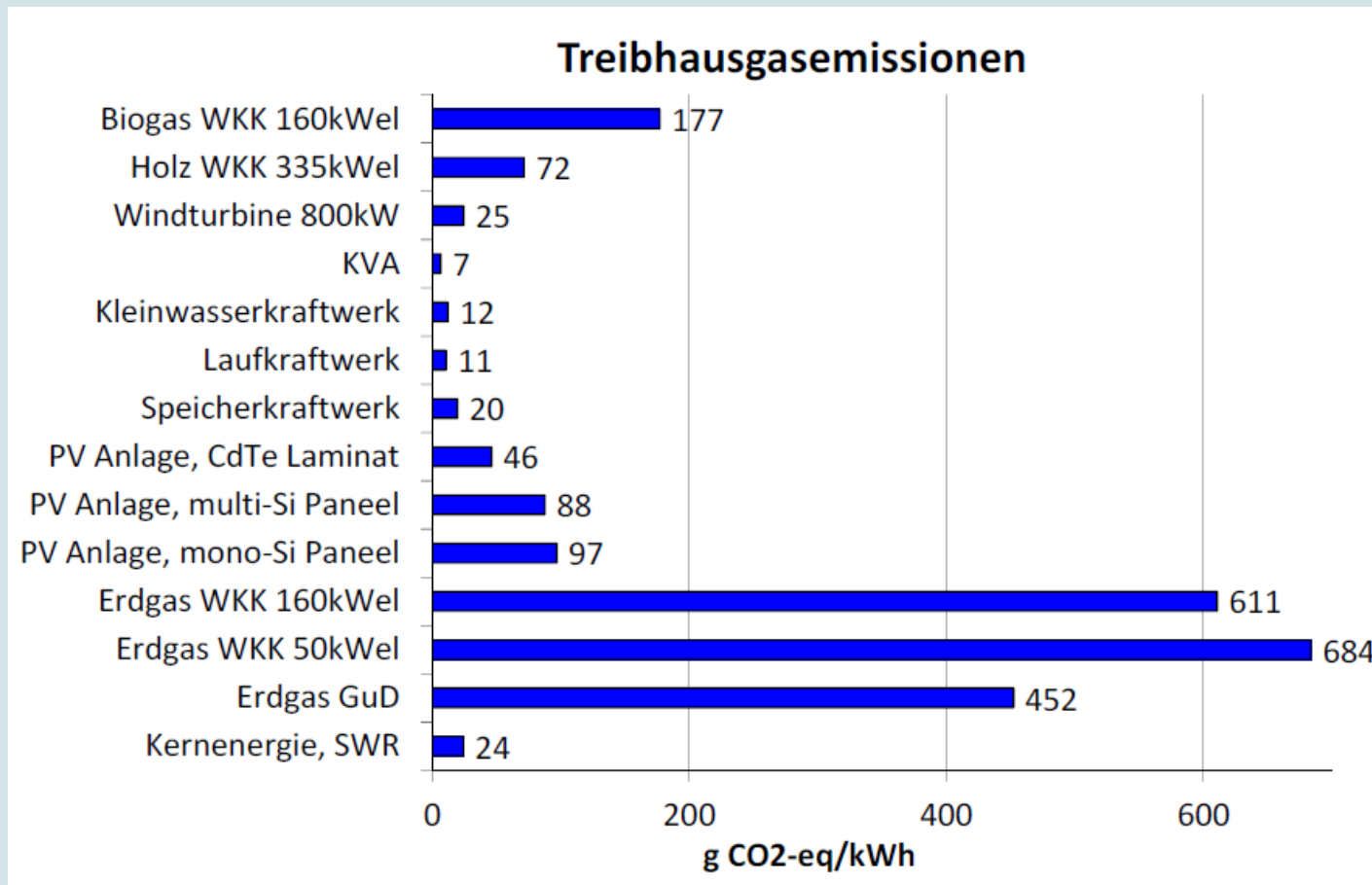


Electricity supply scenario, new energy policy, variant renewables and import (E)



## Environmental impact of electricity production is important for the decision making process

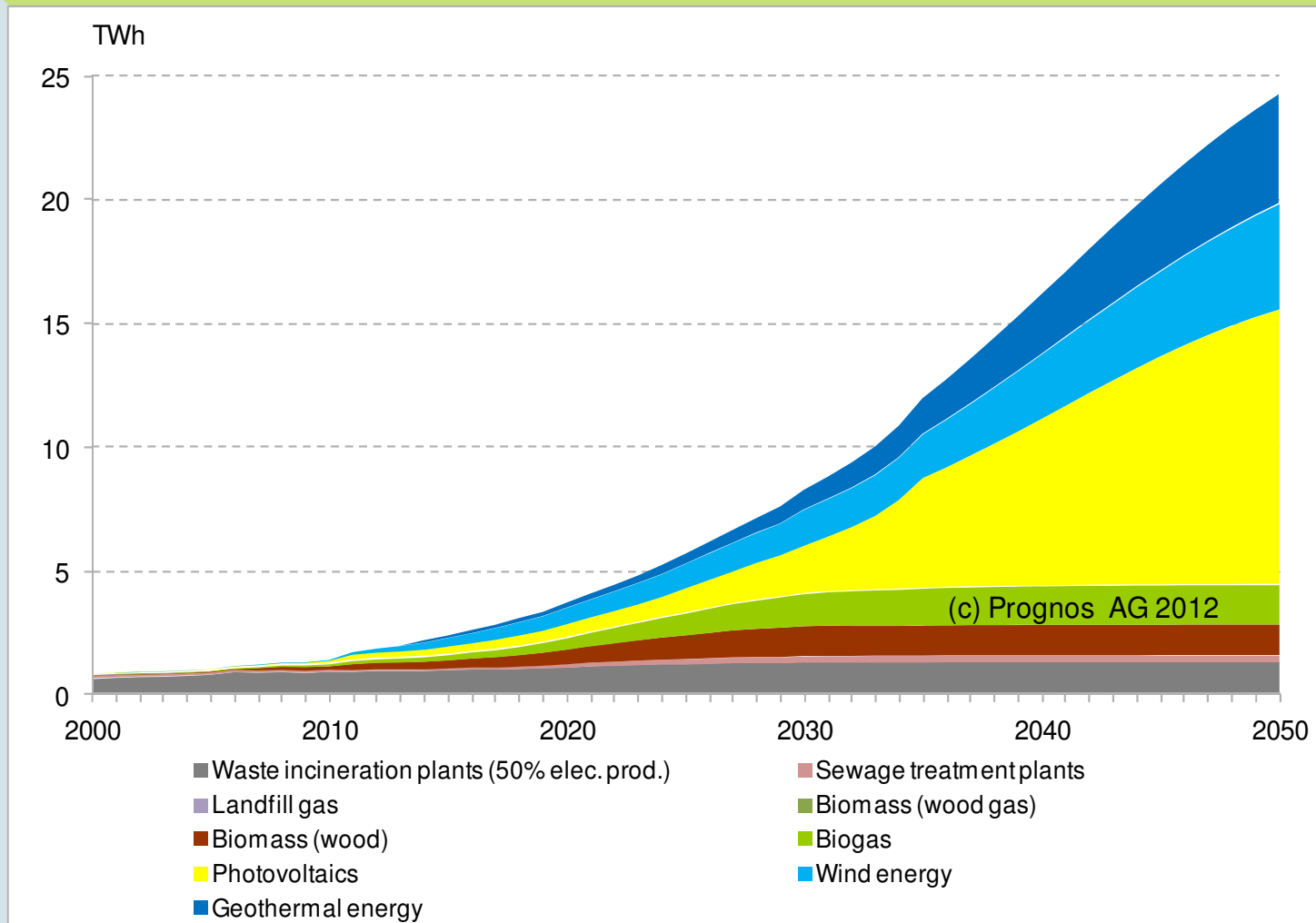
- Excerpt of the LCA-study by Frischknecht, Bauer et al. -







## Long-term approach to electricity production from new renewable energy sources





## Renewable energy has high potential and is to be promoted

**Financial promotion** to be optimised and expanded

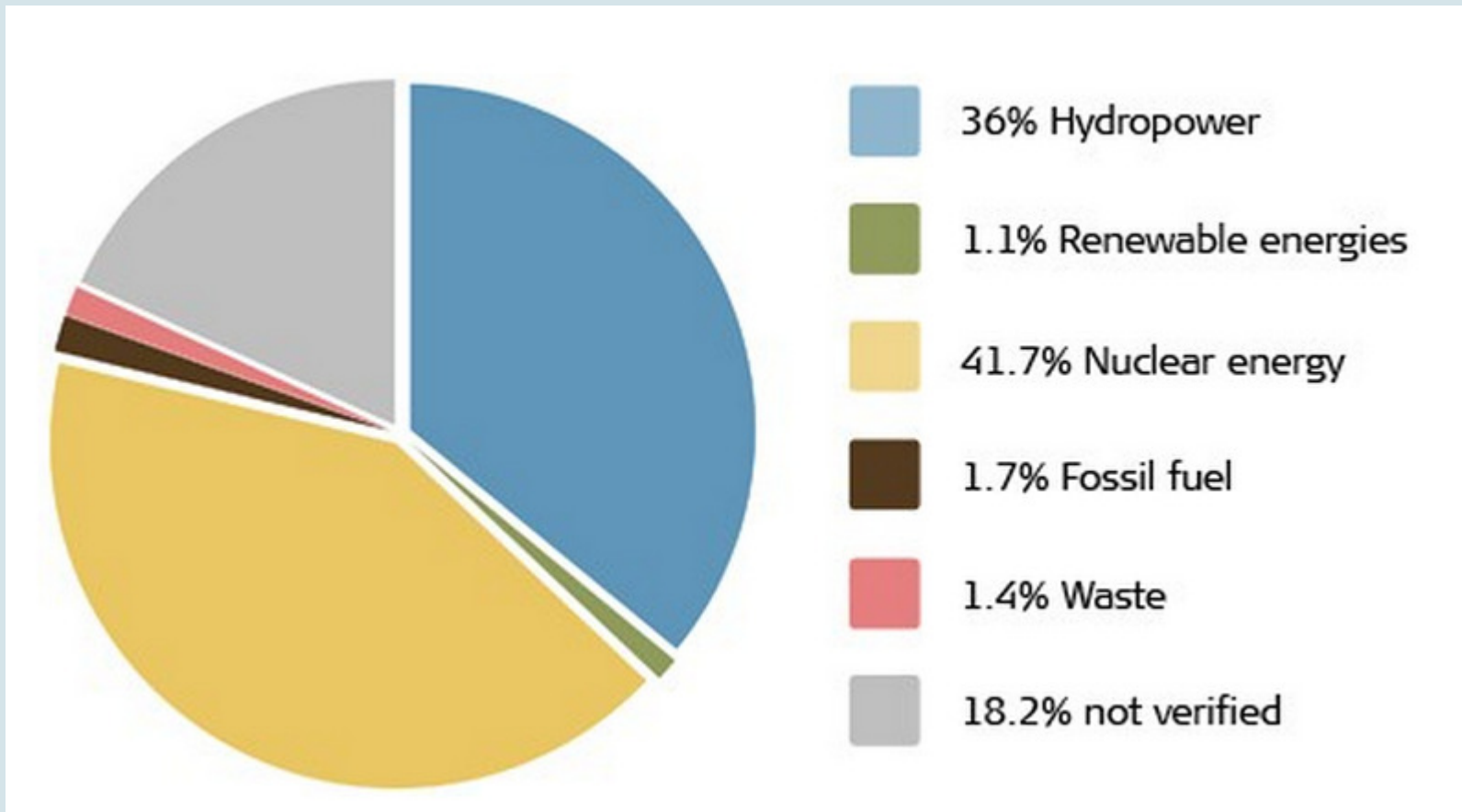
**Supplementary measures:**  
e.g. spatial planning / zoning, national interest for renewable energy





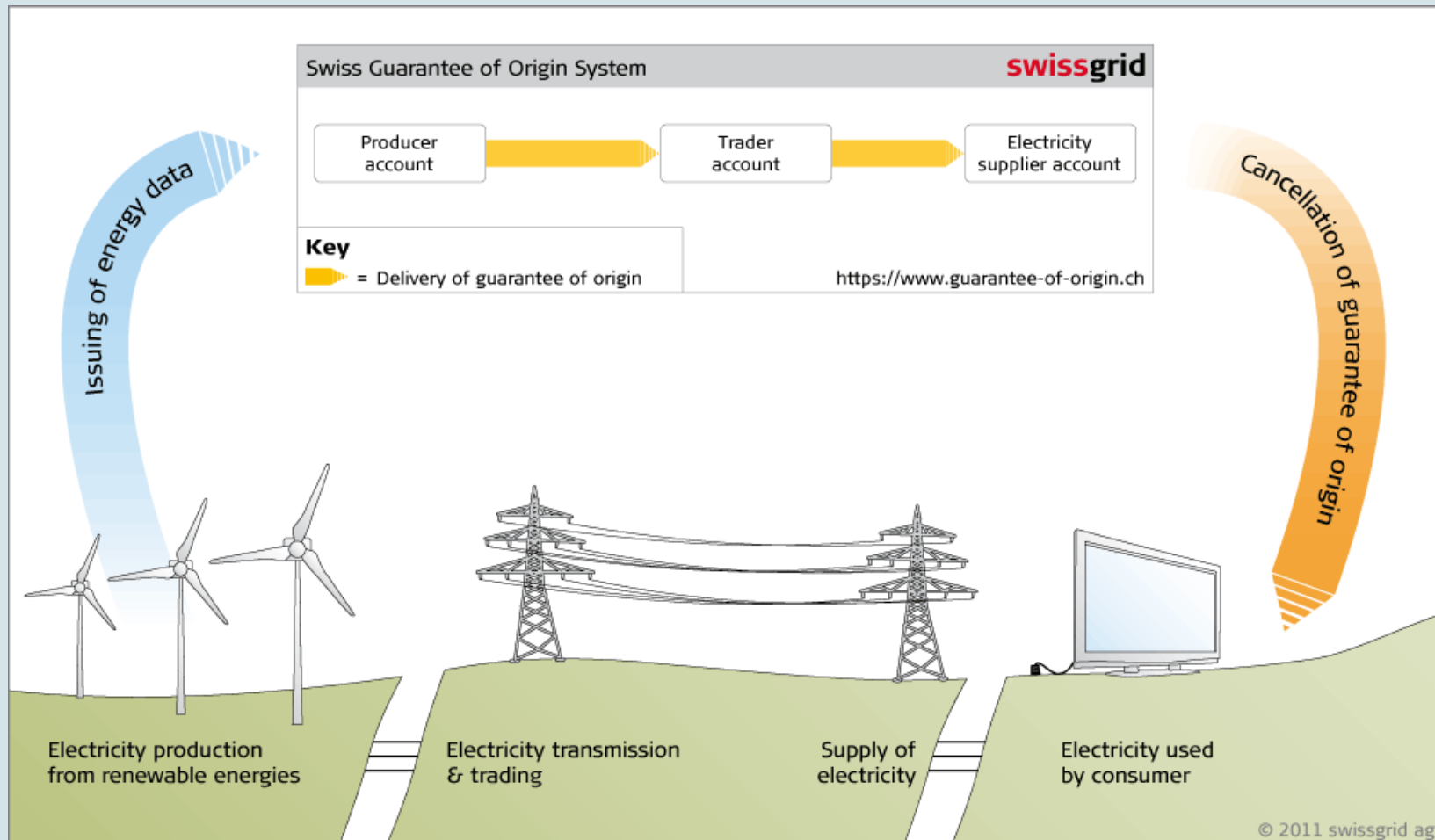
## Transmitting LCA information across the bridge from production to consumption: Electricity disclosure

- Example of a disclosure statement for an electricity consumer -





# Electricity disclosure and tracking via Guarantees of Origin





## EU regulation on environmental impact information on electricity disclosure statements

- Directive 2009/72/EC -

9. Member States shall ensure that electricity suppliers specify in or with the bills and in promotional materials made available to final customers:
- (a) the contribution of each energy source to the overall fuel mix of the supplier over the preceding year in a comprehensible and, at a national level, clearly comparable manner;
  - (b) at least the reference to existing reference sources, such as web pages, where information on the environmental impact, in terms of at least CO<sub>2</sub> emissions and the radioactive waste resulting from the electricity produced by the overall fuel mix of the supplier over the preceding year is publicly available;





## Example of environmental information in the disclosure statement (1/2)



### Étiquetage de l'électricité

conformément au règlement grand-ducal du 21 juin 2010 relatif au système d'étiquetage de l'électricité. Mémorial A N° 98, p. 1802

Fournisseur Enovos Luxembourg S.A.

Produit naturstrom

Site internet [www.enovos.eu](http://www.enovos.eu)

Année 2011

#### Impact environnemental lié aux émissions de CO<sub>2</sub>

émissions faibles  
0 g/kWh

émissions élevées  
1500 g/kWh



#### Impact environnemental lié aux déchets radioactifs

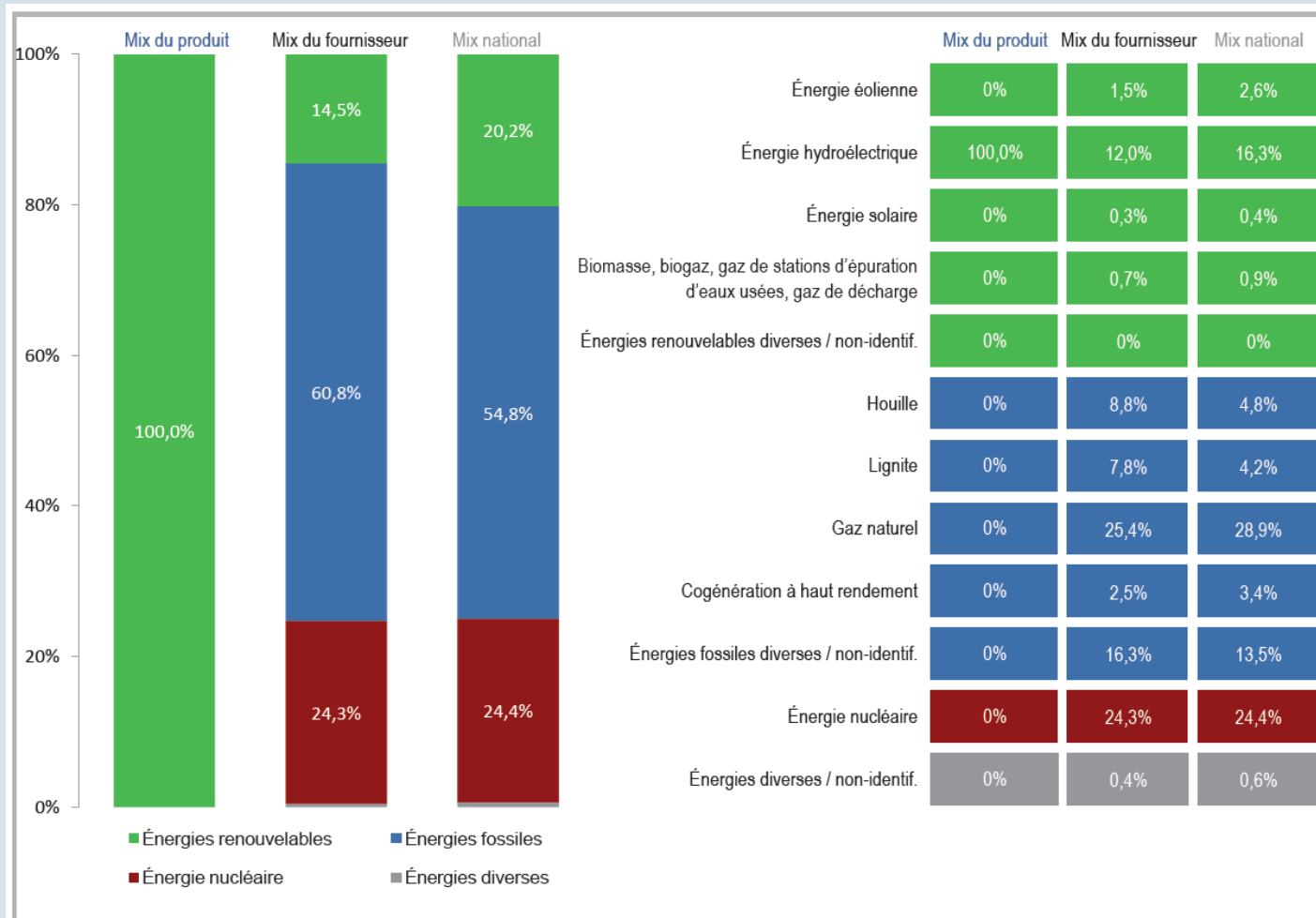
quantité faible  
0 mg/kWh

quantité élevée  
6 mg/kWh





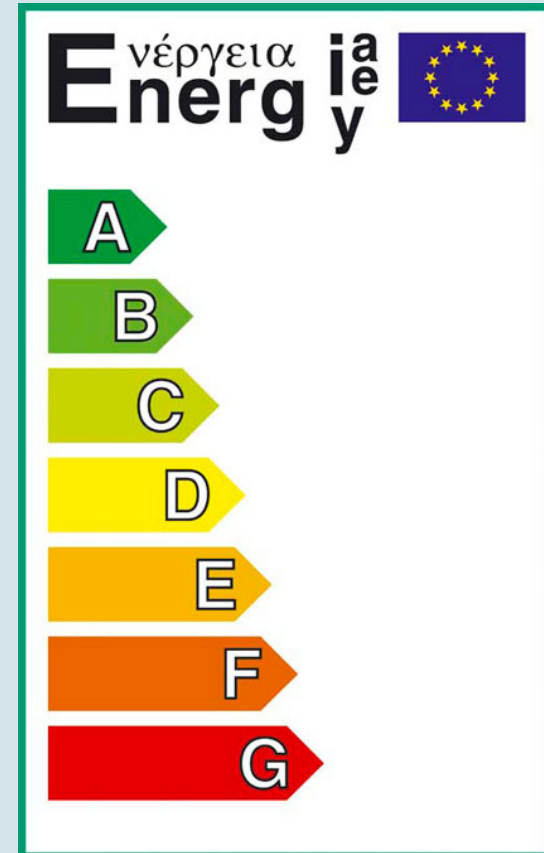
## Example of environmental information in the disclosure statement (2/2)





## Possibilities to be examined for showing environmental impacts in the electricity disclosure statement

- Information about the whole life cycle
  - Taking into account not only CO<sub>2</sub> emissions and radioactive waste
  - Information about the residual mix
- ... while keeping it ...
- Simple and easy to understand for final customers -->





Thank you for your attention!

[www.energiestrategie2050.ch](http://www.energiestrategie2050.ch)  
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