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“WILL THE RENEWABLE ENERGY REVOLUTION TRIGGER DEEP-SEA MINING?”

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PRESENTATION OVERVIEW

1. Given future demand for raw materials: will deep sea mining be essential?

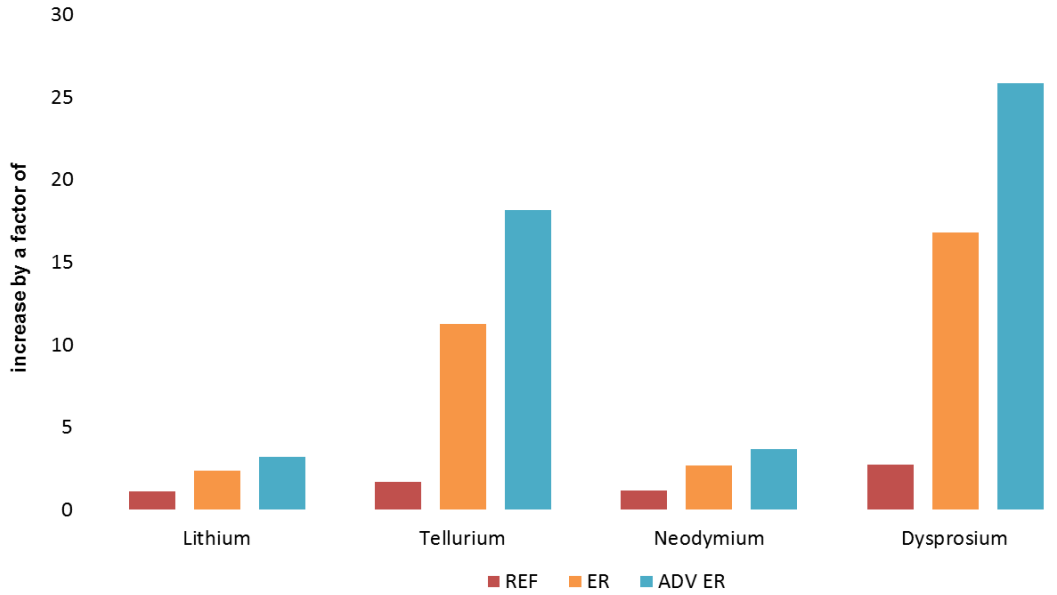
2. How does deep sea mining fit in the EU's aspiration for a circular zero waste economy based on renewables?

3. Can demand for raw materials be managed through the circular economy – i.e. recycling, redesign, repair, reducing planned obsolescence, use of substitute materials.

4. What are the options for future EU policy initiatives?

1. GIVEN FUTURE DEMAND FOR RAW MATERIALS: WILL DEEP SEA MINING BE ESSENTIAL?

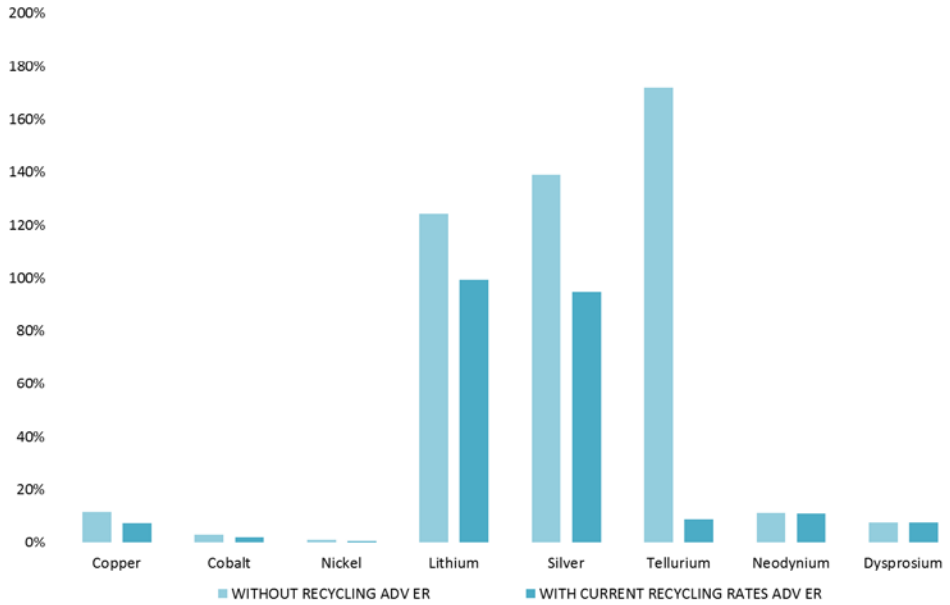
- Deep sea mining is not required for a full renewable energy future
- Required production/mining increase will put pressure on market prices



Projected annual demand in 2030 relative to current production volumes (in 2014)

2. HOW DOES DEEP SEA MINING FIT IN THE EU'S ASPIRATION FOR A CIRCULAR ZERO WASTE ECONOMY BASED ON RENEWABLES?

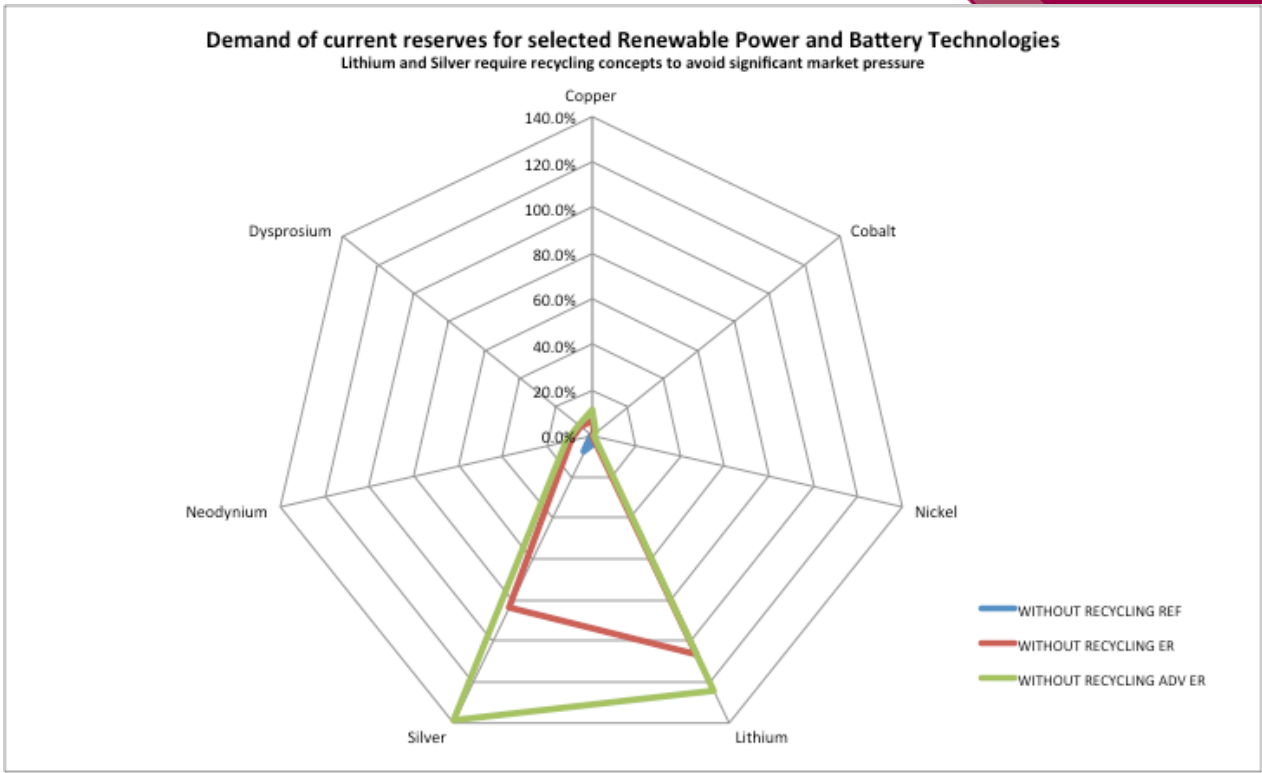
- Recycling of materials from renewable energy technologies is possible and essential to safe resources
- Deep Sea Mining is not required for the renewable industry



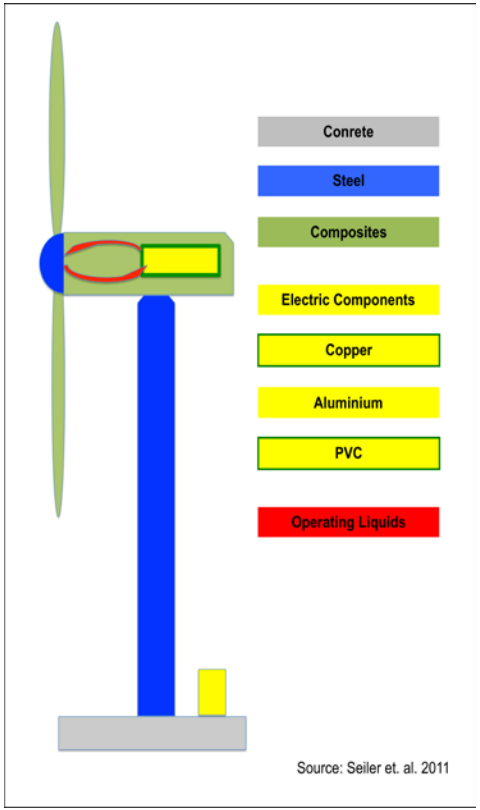
Cumulative resources required relative to current reserves, with and without recycling under the advanced scenario

3. CAN DEMAND FOR RAW MATERIALS BE MANAGED THROUGH THE CIRCULAR ECONOMY

- Recycling of raw materials is essential for renewables and – especially – storage technologies
- Recycling concepts required
- Product design is key
- Establish policies and regulations in the early market phase



4. WHAT ARE THE OPTIONS FOR FUTURE EU POLICY INITIATIVES?



- Recycling requirements for RE equipment e.g. solar pv electronic waste regulation
- Research and development funding for recycling concepts
- Build up infrastructure to collect materials parallel to market expansion
- Support innovative resource management e.g. steel and copper buy back in wind turbines

Thank you

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