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# Early Warning Systems

With regard to the UNECE Pathways to Sustainable Energy project

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# Agenda

- Concept: Early warning system with regard to the pathways project
- Group work on the possible signposts of the early warning system
- Presentation of group results
- Short discussion

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# Early Warning Systems (EWS) at a Glance

## What is an early warning system and what does it do?

- System for early detection of hazards or undesirable developments or events
- Reducing damage through early warning of natural disasters and other undesirable events

## The aim of an EWS is to provide a useful framework for

- Increasing awareness
- Formulation and implementation of intervening measures

 **Commonly used in case of natural disasters**

# The EWS in the context of the pathways project

## What are the peculiarities in our context?

- The EWS does not have to record sudden events with extreme values, rather indicates undesirable developments
  - Focus on **accuracy** of monitoring and countermeasures

## What can we monitor?

- *“[Indicators] help incorporate physical and social science knowledge into decision-making, and they can help measure and calibrate progress toward sustainable development goals. **They can provide an early warning** to prevent economic, social and environmental setbacks. They are also useful tools to communicate ideas, thoughts and values” (United Nations, 2007)*

 **Comparison of model data and real data form the basis of the EWS**

# Short excursion for the clarification of terms

## Key performance indicators (KPI):

- particularly important indicators for which target values are defined in the medium to long term (A number of indicators have already been defined)

## Signposts or interim performance indicators (IPI):

- Signposts are the temporal development of several indicators. These indicators therefore describe a pathway to target achievement
  - Signposts can describe the pathway to a predefined KPI
  - Signposts can be more detailed than KPIs and in some cases can also explain them (Kaya Identity)
  - Unlike KPIs, model data do not necessarily have to be available for signposts if there is a social target value (e.g. households connected to the grid)

 **The EWS is therefore based on signposts**

# Adaptive policy pathways

## Adaptation pathway approach

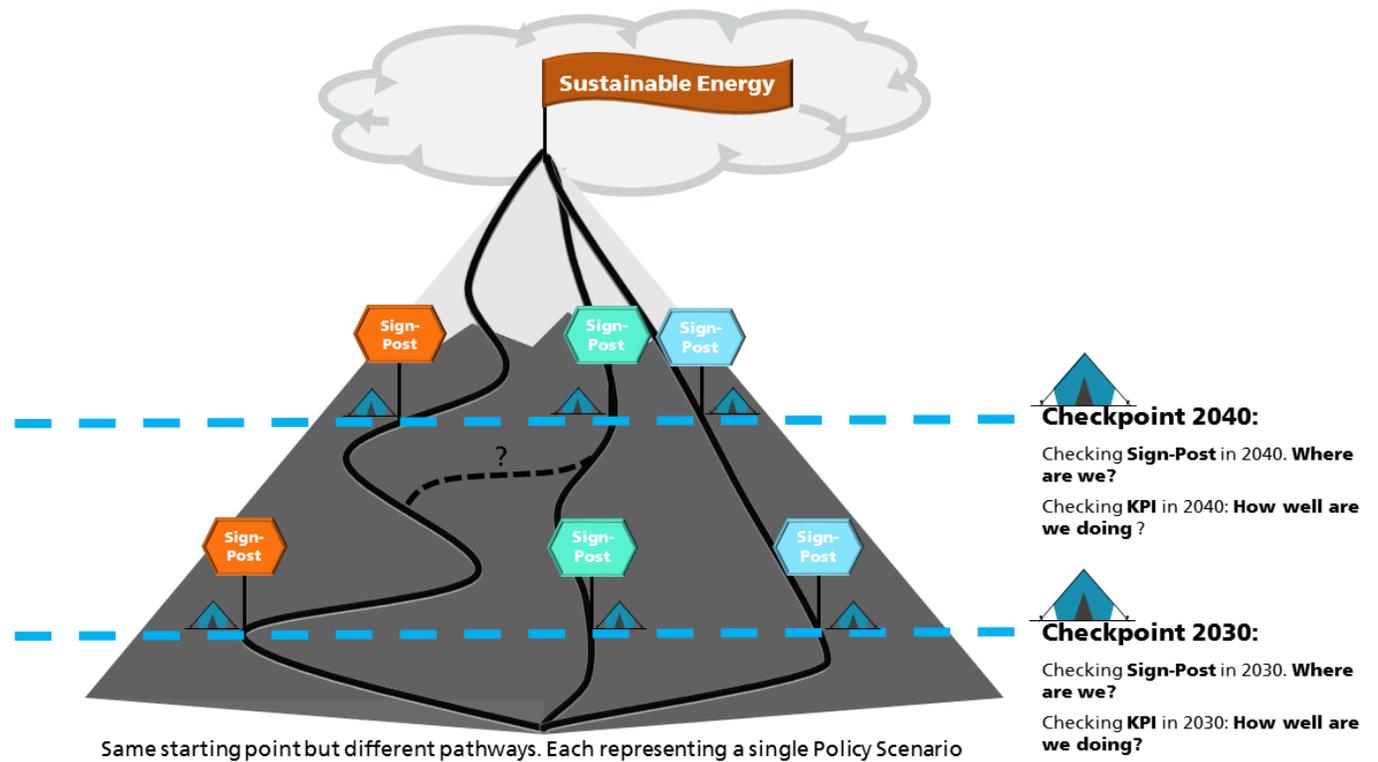
### Result:

Map with possible pathways, which presents alternative routes to get to the same point in future

### Important:

It will be impossible to locate and draw all possible pathways.

- Only the modelled scenarios can be drawn in.



# The EWS in the context of the pathways project

## Why is an EWS required in the pathways project?

- Deviations from modelled path possible due to uncertain future
- Early detection of deviations
- Immediate implementation of countermeasures

## What must the early warning system be able to do in the project context?

- Early detection when we leave the path or run the risk of not achieving the long-term targets
- Clear indications of causes

# Properties of KPIs and potential challenges

## What properties must a signpost suitable for the EWS have?

- Provides information on relevant levels of target achievement
- Overarching, little detailed signposts
  - A detailed signpost would lead to constant deviations (model projection unequally real world)

## Potential challenges

- What if we are in-between pathways or change from one to the other over time?
- The models provide projections but uncertainty increases as you look further into the future.

 **The EWS is rather a framework structure that is not fixed to the models currently in use, as it can be easily applied to other models.**

# How the monitoring process works

## The EWS measures the difference between model and real data for all selected signposts

- The greater the deviation, the greater the probability that we are not on the desired path
- Currently, the comparison of the NDC scenario and the 2-degree scenario already represents such a type of analysis.

## What happens if an intervention becomes necessary?

- Locating the deviation
- Check whether deviation requires countermeasures
- Choice of countermeasure
- **Outside project focus**

# Aim of the EWS

## 1. Translate results into a comprehensible framework

- KPIs/Signposts should improve decision-making for sustainable development
- KPIs/Signposts should explain linkages of decisions and decision outcomes

## 2. A model-independent indicator system

- KPIs/Signposts should provide information on the degree to which the objectives have been achieved
- KPIs/Signposts should be able to display when the desired pathway is left

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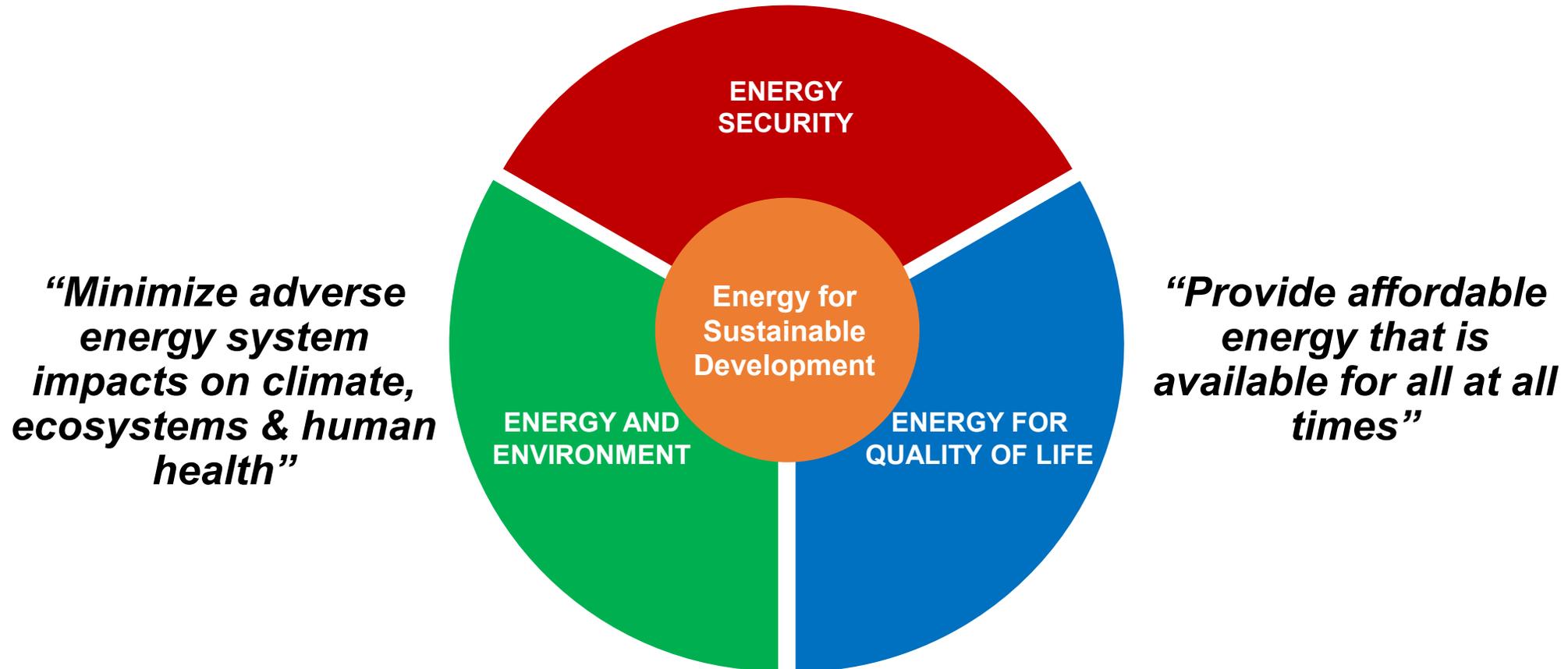
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# Three Pillars

***“Secure the energy needed for economic development”***



# Group work

## Questions

- Are there other relevant signposts that do not appear on the list?
- Are there any signposts on the list that are not useful?
- For which signposts are no real data available or only poorly available?
- How would you prioritize the signposts?

# Further questions that will become important in designing of the EWS

## Who is responsible for the EWS?

- Member States?
- Problem: Model data are only available at regional level and not at country level.

## When does a deviation require intervention?

- Specific percentage/absolute deviation?
- Continuous deviation of a KPI in one direction?
- Is the deviation of one KPI sufficient to justify an intervention or do several KPIs have to deviate?
- If several KPIs deviate in the same direction, does the deviation need to be lower than if only one KPI deviates?