



The sustainability of snowmaking

A conceptual analysis

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Outline

- Sustainable snow production – A relevant topic ?
- Snowmaking – is it necessary ?
- Different modes of snow production and its reasons
- Sustainability of snowmaking
- Potential impacts of climate change
- Concluding remarks



Sustainable snow production – A relevant topic ?



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Background – Energy consumption

- Energy index of Austrian cableways in the last 10 years increased by 43,8 % (Manova 2009)
- 5,3 % of annual turnover is spent for energy (2008/09)
- Snowmaking accounts for 1/3 to 2/3 of total energy consumption of ski lift companies depending on the type of snowmaking and intensity



Background – Costs of snowmaking

- Costs of snowmaking between 10-20% of turnover
- A further increase is to be expected in the next years



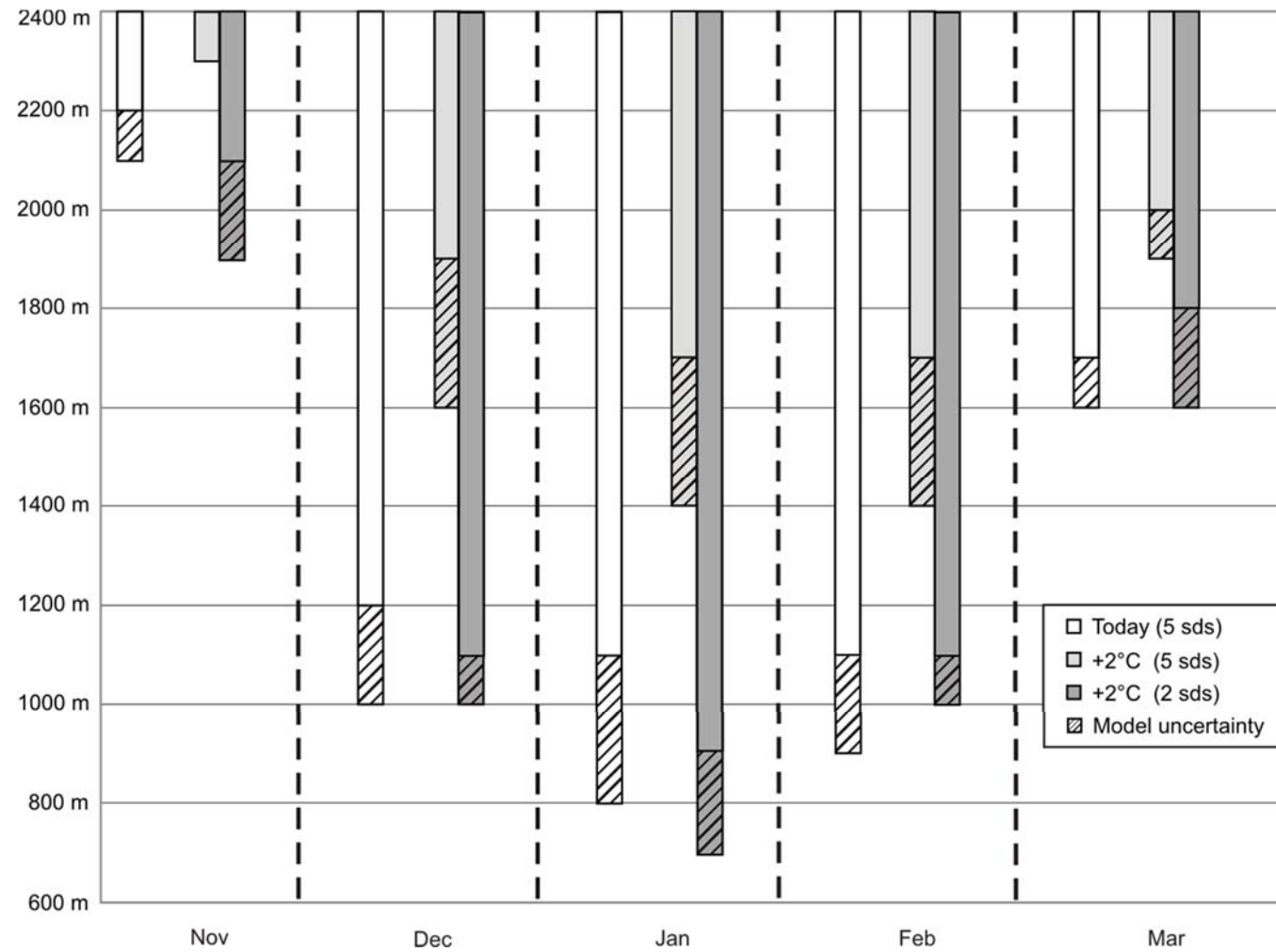
Snowmaking – is it necessary ?



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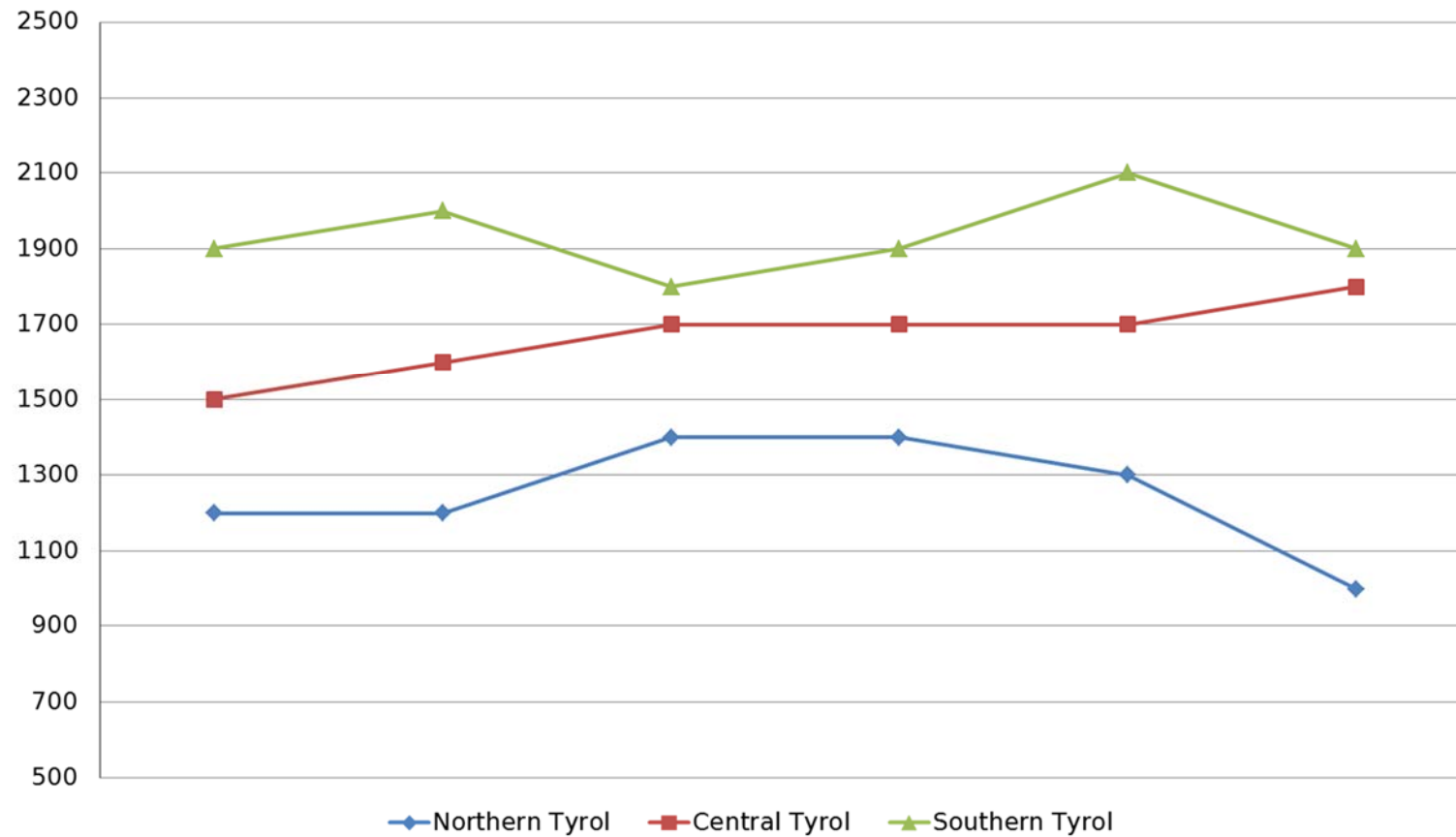
Snowmaking - is it necessary ?





Snowmaking – is it necessary ?

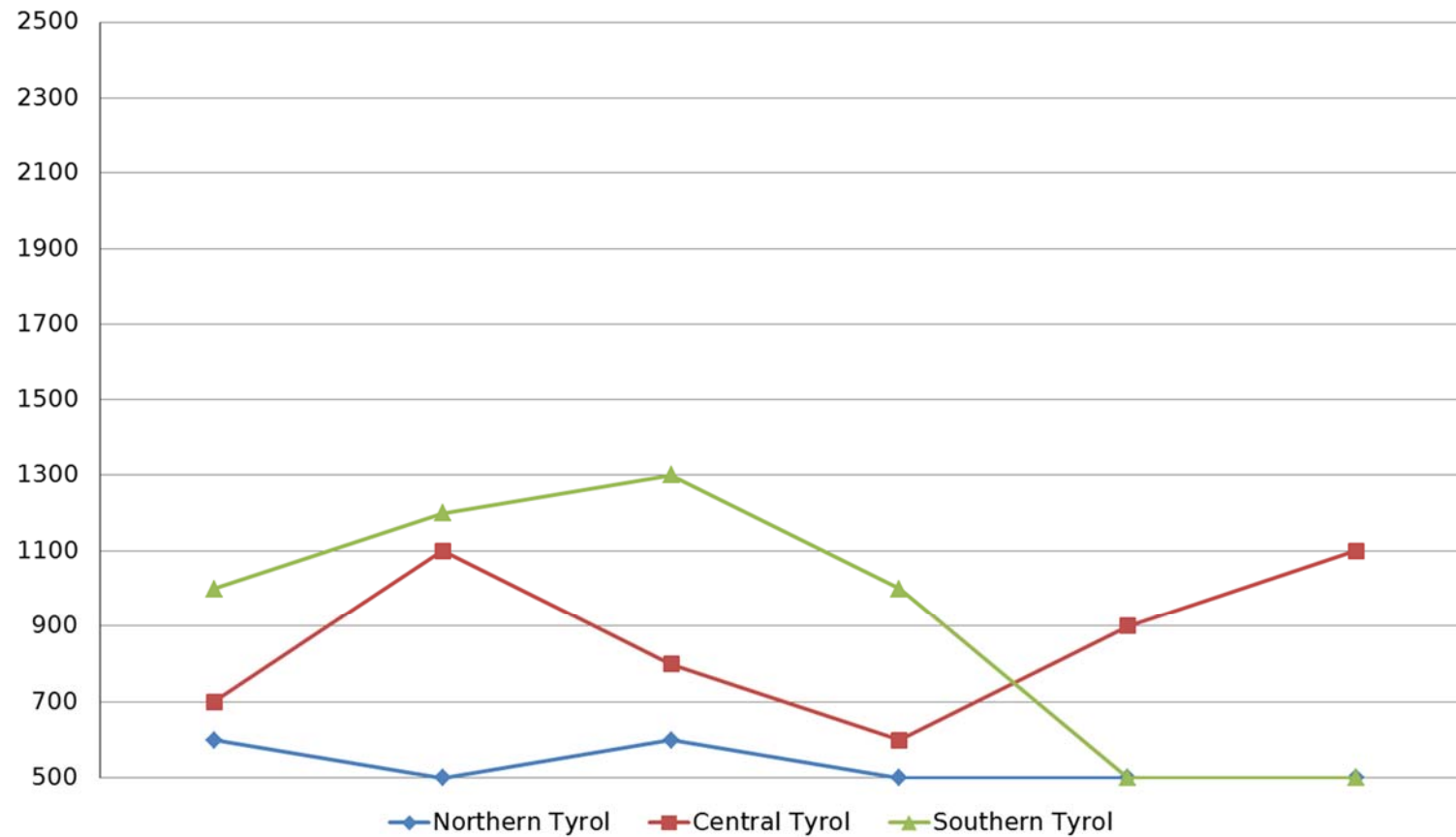
The altitude of natural snow reliability
from West to East (Tyrol)





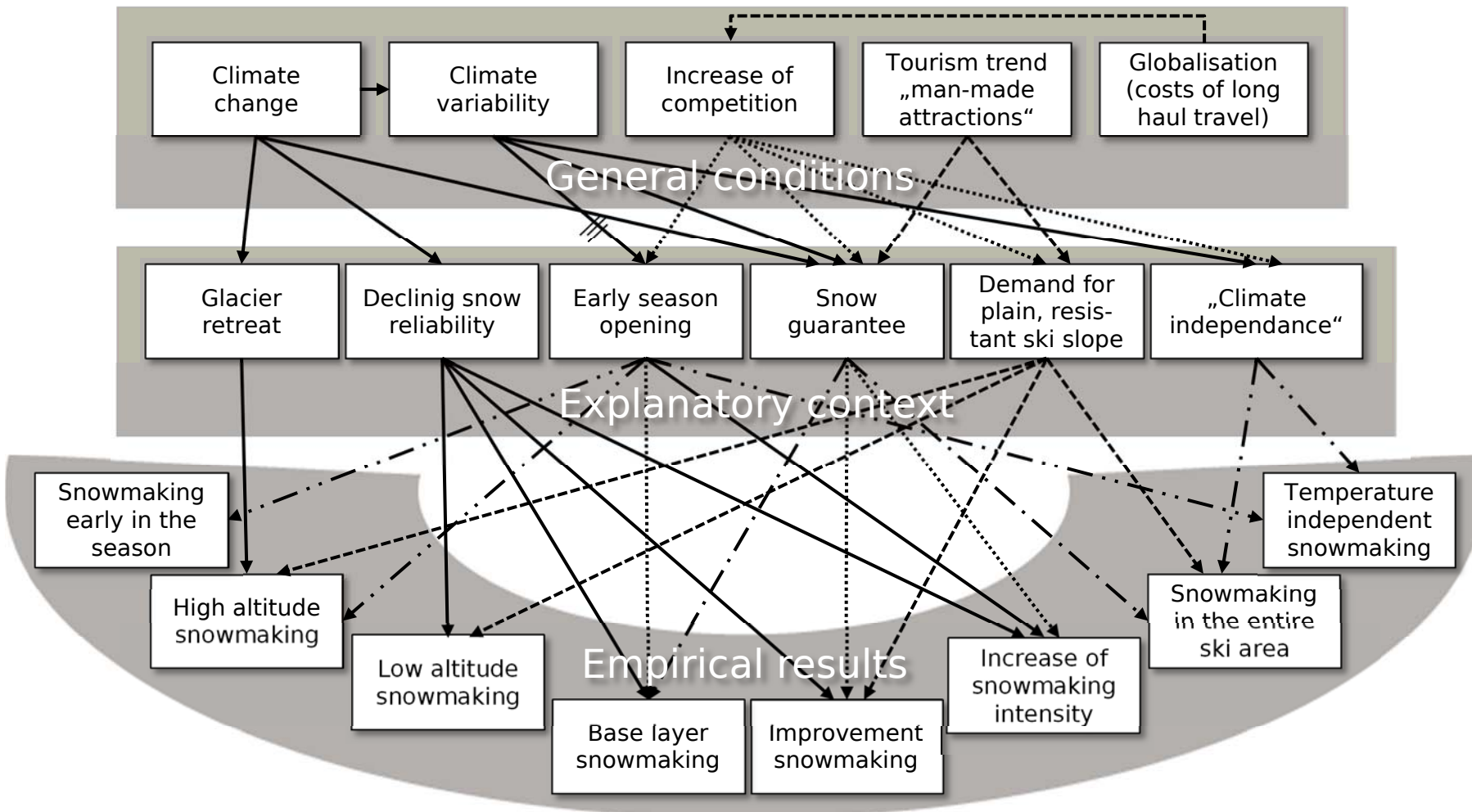
Snowmaking – is it necessary ?

The altitude of technical snow reliability from West to East (Tyrol)



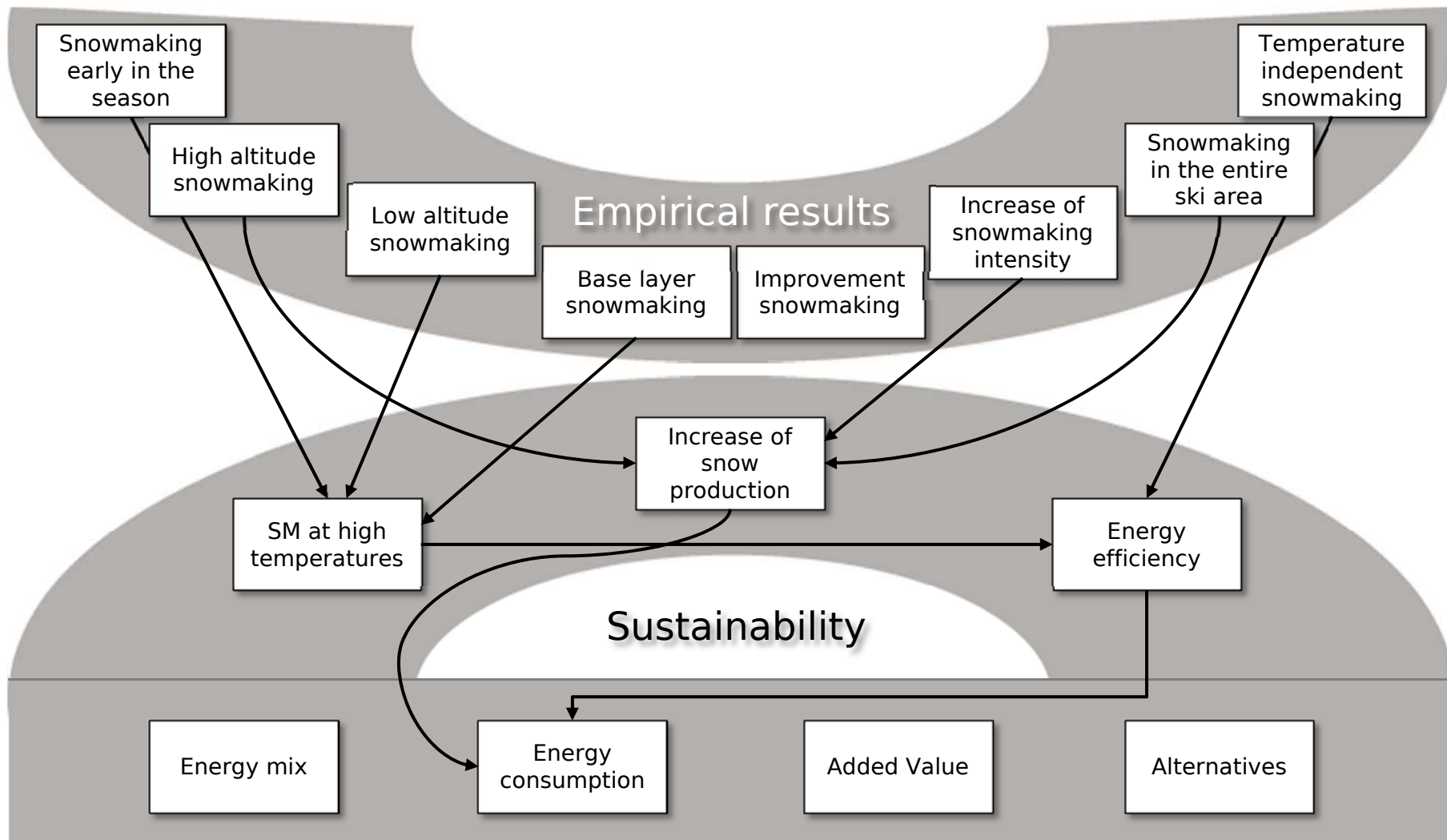


Different modes of snow production





Sustainability ?





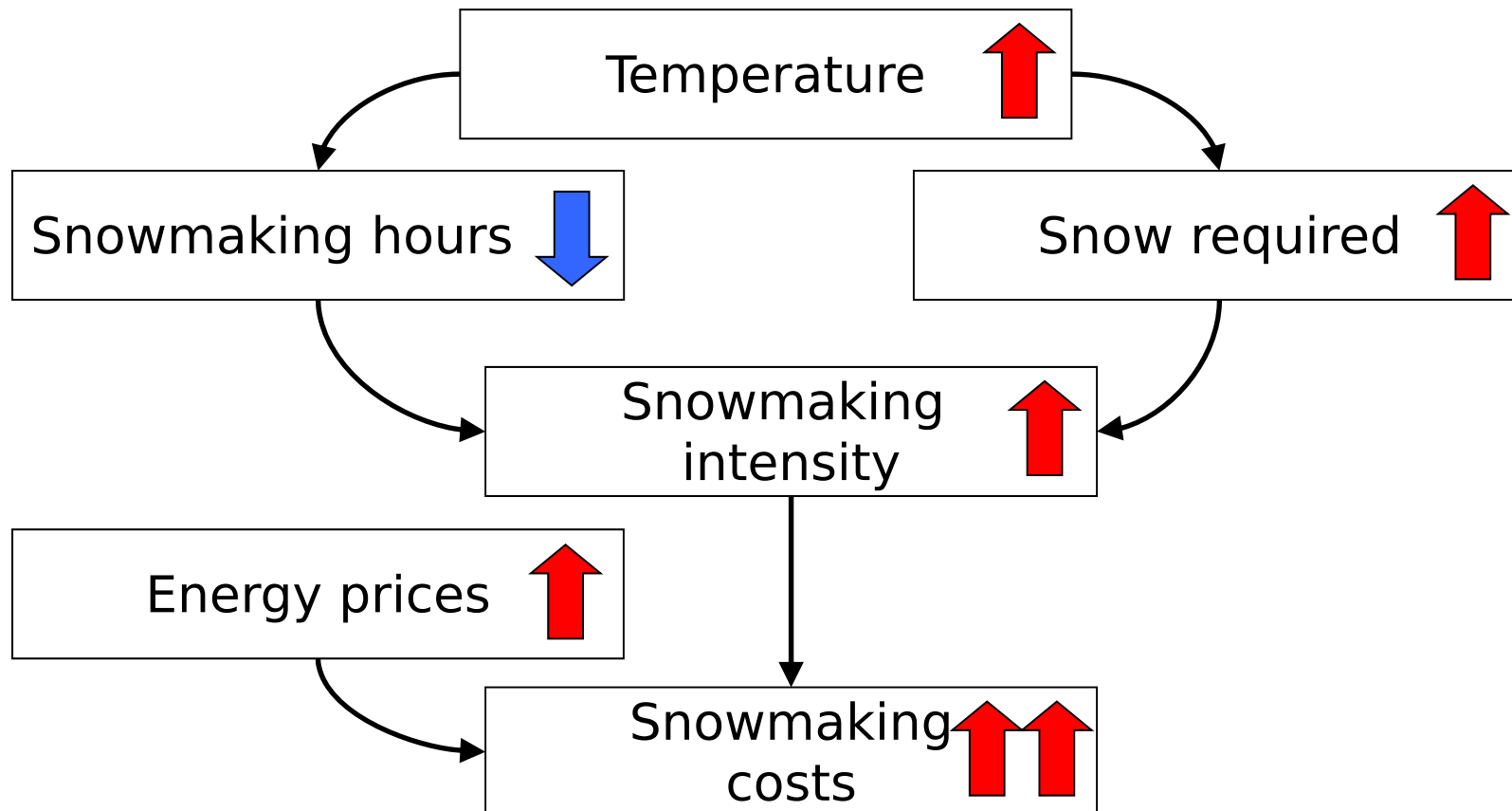
Potential impacts of climate change



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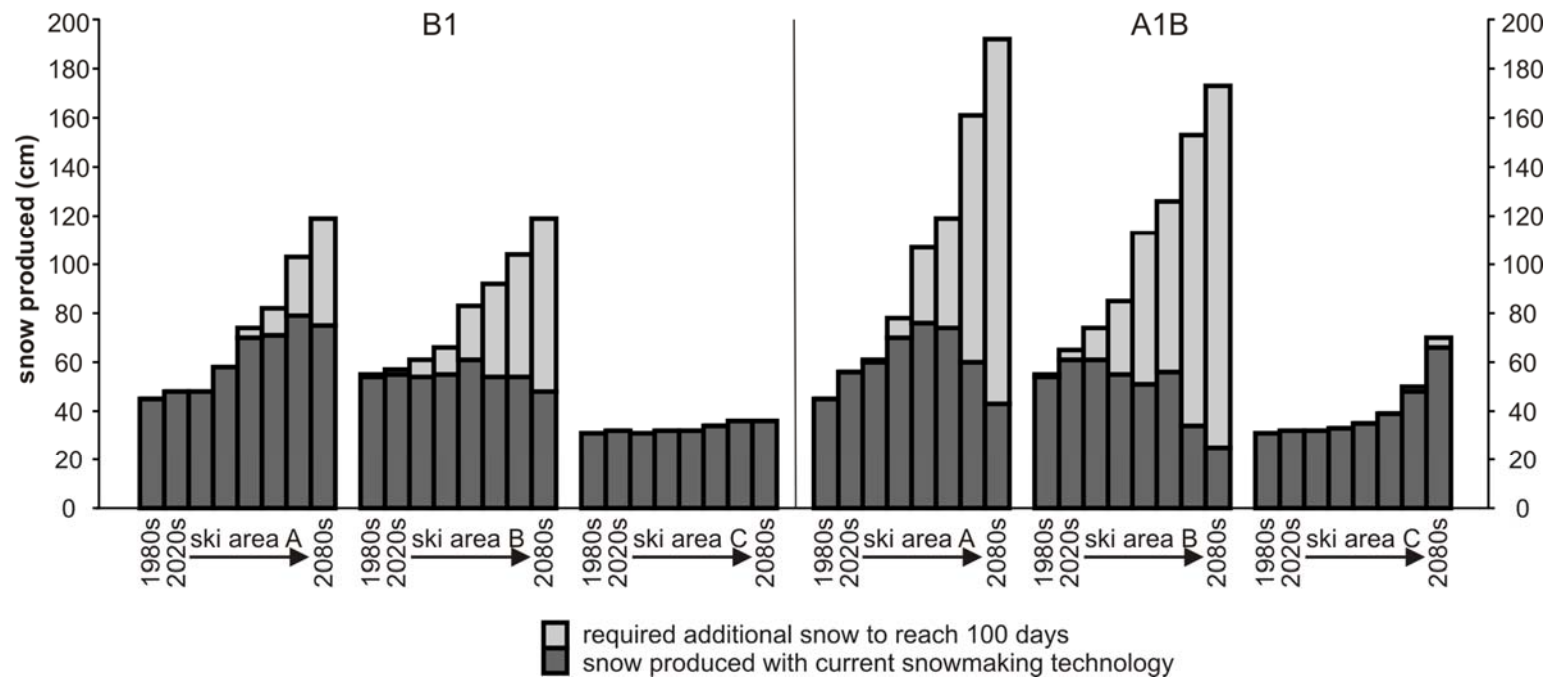


Potential impacts of climate change





Potential impacts of climate change





Actions required for sustainable snow production

- Change in the (temporal & spatial) use of snowmaking
- Increase snowmaking efficiency
- Monitor specific snowmaking costs & gains from it
- Further technological development to increase energy efficiency
- Own energy production from renewable sources



Thank you!



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