WFD & SHP – facts, strategies, costs and compensation

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Facts

The WFD shows impressively that there was little reflection about the impacts and consequences in terms of hydropower

Hydropower at any size is in fact significantly and negatively affected by the WFD!

There is a substantial goal conflict between WFD and the renewable energy directive

Does the WFD aim at an integrated and sustainable environmental protection ?

NO – the WFD aims at the protection of water bodies

Any reduction of hydropower production is an attack on global environmental protection due to non-renewable replacement

Loss of one GWh means additional emissions of about 500 t CO_2

The implementation of the WFD may hinder measures of global environmental protection

Costs and restrictions

Additional investment cost

Additional operation cost

Reduced energy production

In detail

Erection of new plants becomes extremely difficult

Increase of residual flow

Improvement or new installation of fish bypass systems

Reduction of distance between bars of screen

Reaction

Active strategy based on environmental competence

Cooperation with governmental bodies

Proposing consensous solutions

River / catchment based grouping of SHP operators

Precise estimation of costs due to expected investment

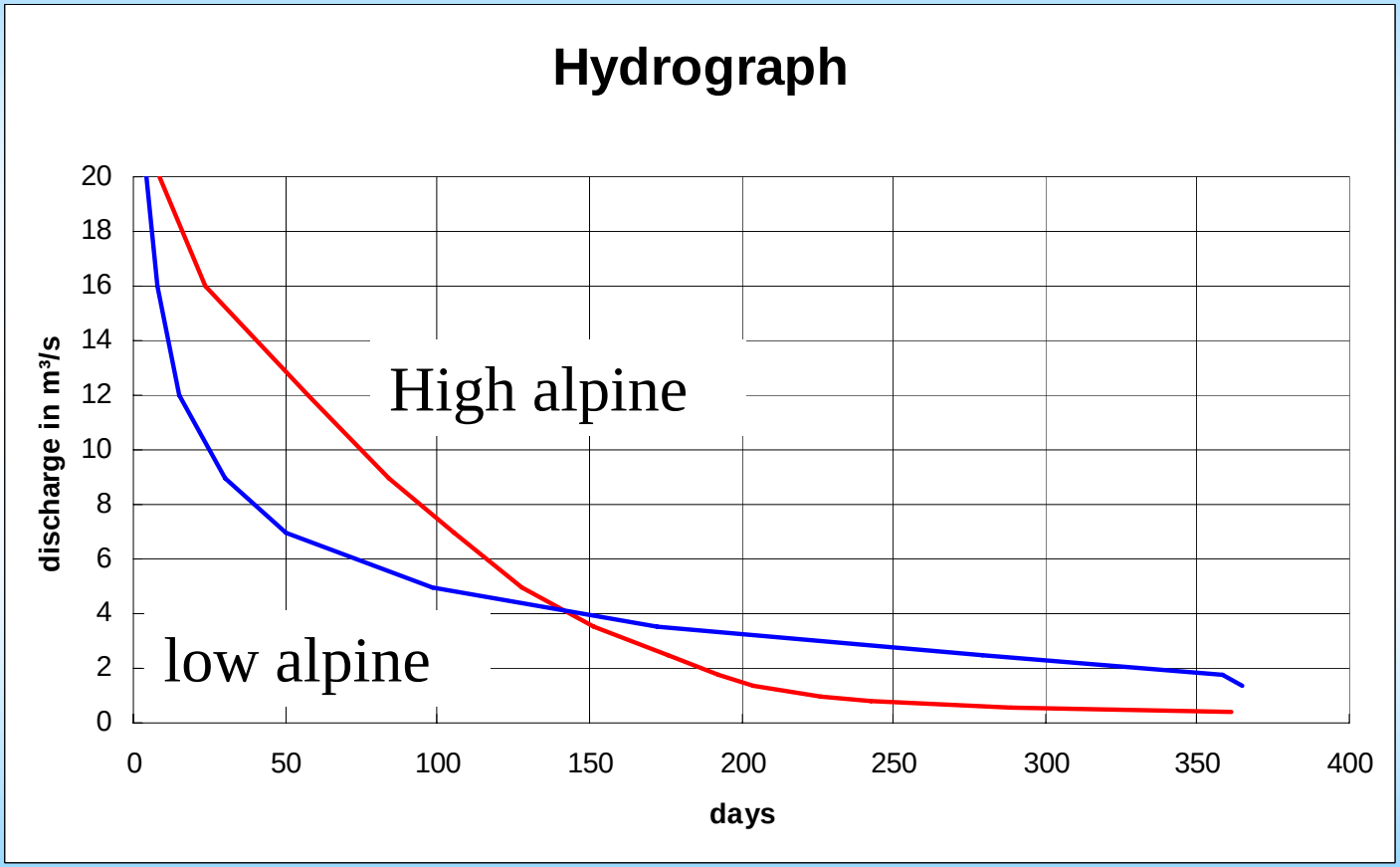
Precise calculation of production loss due to expected alterations

Production loss due to reserved flow

Depending on:

- Recent amount of reserved flow
- Hydrological characteristics
- Ratio between rated discharge and mean flow

Testing results



Results in detail

Reserved flow as Percentage of mean flow	Isel	62,73%	82,62%	**100,00%**	114,33%	127,51%
	kWh/a	1.156.036	1.522.663	1.842.862	2.107.026	2.349.776
		50	75	**100**	125	150
	0	100	100	100	100	100
	2	96,37	96,94	97,23	97,57	97,64
	4	92,74	93,88	94,45	95,15	95,29
	6	89,1	90,81	91,68	92,72	92,93
	8	85,47	87,75	88,91	90,3	90,57
	10	83,1	85,64	86,92	88,56	88,83
	12	80,72	83,53	84,94	86,82	87,09
	14	79,14	82,03	83,45	85,52	85,74
	16	77,56	80,52	81,96	84,12	84,39
	18	76,26	79,23	80,65	82,77	83,19
	20	74,97	77,95	79,35	81,43	81,98

Results in detail

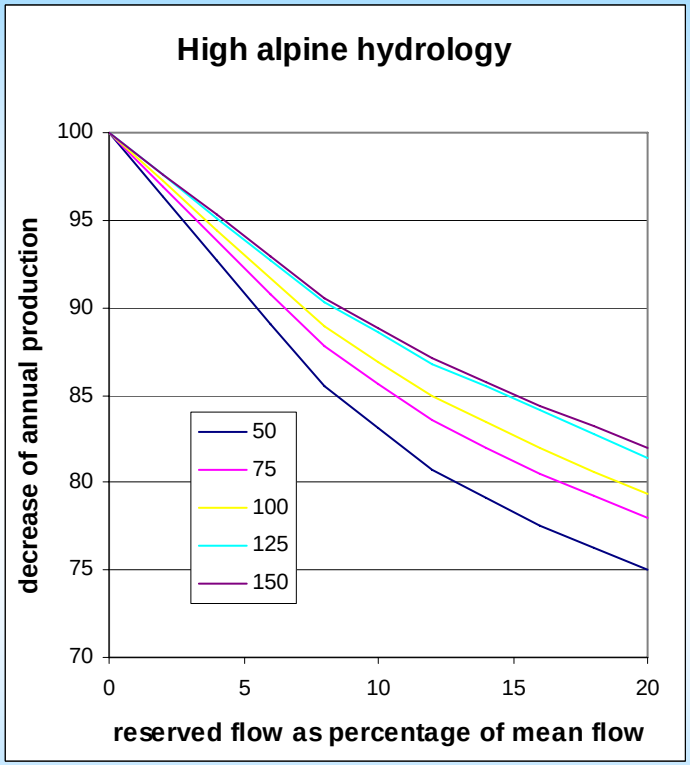
Reserved flow as Percentage of mean flow	Feistritz	72,65%	89,49%	**100,00%**	105,34%	109,85%
		1.701.054	2.095.298	2.341.451	2.466.528	2.571.994
		50	75	**100**	125	150
	0	100	100	100	100	100
	2	97,73	97,45	97,31	97,44	97,4
	4	95,47	94,91	94,62	94,89	94,79
	6	93,2	92,36	91,92	92,33	92,19
	8	90,94	89,81	89,23	89,78	89,59
	10	88,67	87,27	86,54	87,22	86,98
	12	86,4	84,72	83,85	84,67	84,38
	14	84,14	82,18	81,15	82,11	81,78
	16	81,87	79,63	78,46	79,47	79,17
	18	79,61	77,08	75,77	76,76	76,57
	20	77,34	74,54	73,08	74,04	73,97

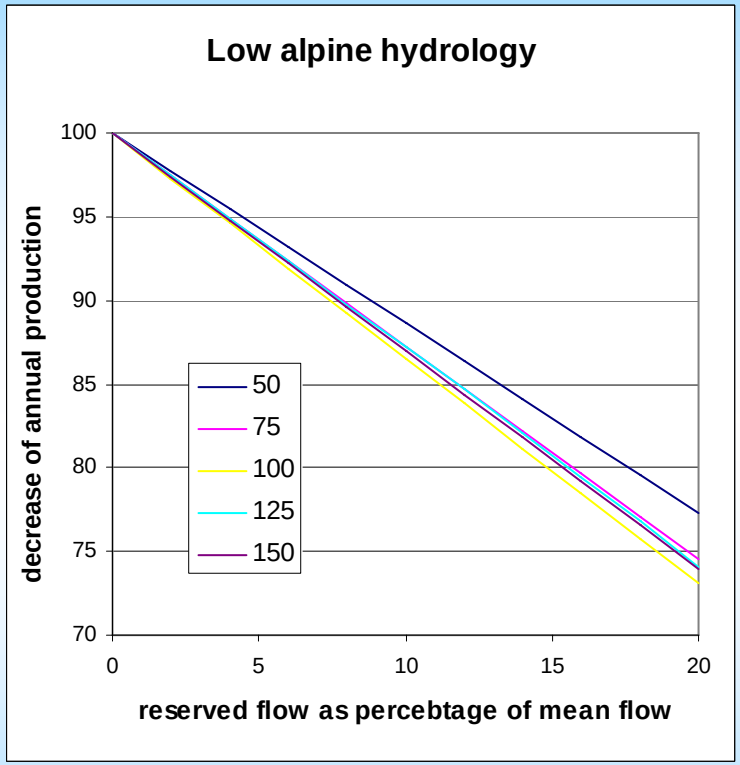
Results - summary

In case of high alpine hydrology and reserved flow being 10% of MQ the losses differ between 11%(high degree of exploitation)and 17% (low degree of exploitation) related to annual production

In case of low alpine hydrology and reserved flow being 10% of MQ the losses are more or less constant with 12% to 13% related to annual production with little influence of degree of exploitation

Results - summary





degressive function

linear function

Compensation measures

The target: an ecologically - economically win – win situation

The tools to compensate the losses:

- Increase of rated discharge
- Increase of head by
  - Increase of top water level
  - Lowering the tailwater level
  - Decrease of head loss

The tools to minimise the losses:

- river restructuring of diversion reaches
- clever and adjusted fish ladder concepts minimising the flow needed for functioning

Conclusions

The WFD offers the opportunity of repositioning HP as environmental friendly

The implementation of the WFD needs necessarily a consensus between government and HP operators

There is no reason for being anxious but several reasons for being offensive

There is no alternative comparable with HP


Thank you !