

Klimagassutslipp fra vannkraft og magasiner





NATURHISTORISK MUSEUM UNIVERSITETET I OSLO



NINA

un Research

Atle Harby

Centre for environmental design of renewable energy – CEDREN SINTEF Energy Research









+ some experts!



→ No more misleading science?





GHG emissions for different technologies (Source: SRREN)





Carbon Cycle



http://earthobservatory.nasa.gov/Library/CarbonCycle/carbon_cycle4.html





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Integrating Inland Waters into the Terrestrial Carbon Budget



What happens when a reservoir is created?

Do these arrows change?

Tucuruí before impoundment

1979

Tucuruí before impoundment

Tucuruí after impoundment

Pre impoundment GHG balance









Post impoundment GHG balance







Net emissions concept



Divided into components

- 1 River basin
- 2 Downstream river reach





Net emissions concept

After reservoir construction

Divided into components

- 1 River basin with reservoir
- 2 Reservoir
- **3** River reach between dam and power plant outlet
- 4 River reach downstream power plant outlet



File: CM 1912 010 100421 fb9



Main processes





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Main processes in the reservoir





1) Net emissions = sum of all arrows 2) Net carbon balance = sum of all arrows

after Huttunen





Conceptual Model - CH4



from B. Sherman

Net emissions =



After impoundment









From Julie Bastien

Excluding unrelated anthropogenic sources





From Joel Goldenfum





Spatial and temporal resolution











Comparision of gross emissions











Technology for a better society

Source to biased conclusions – reported high **gross** reservoir emissions from Brazil







Nam Ngum, Laos: - 60 g CO₂/kWh





Technology for a better society

....takk for oppmerksomheten!