



for a living planet

The WWF Climate Solutions Vision for 2050 & hydropower

Mr Jamie Pittock

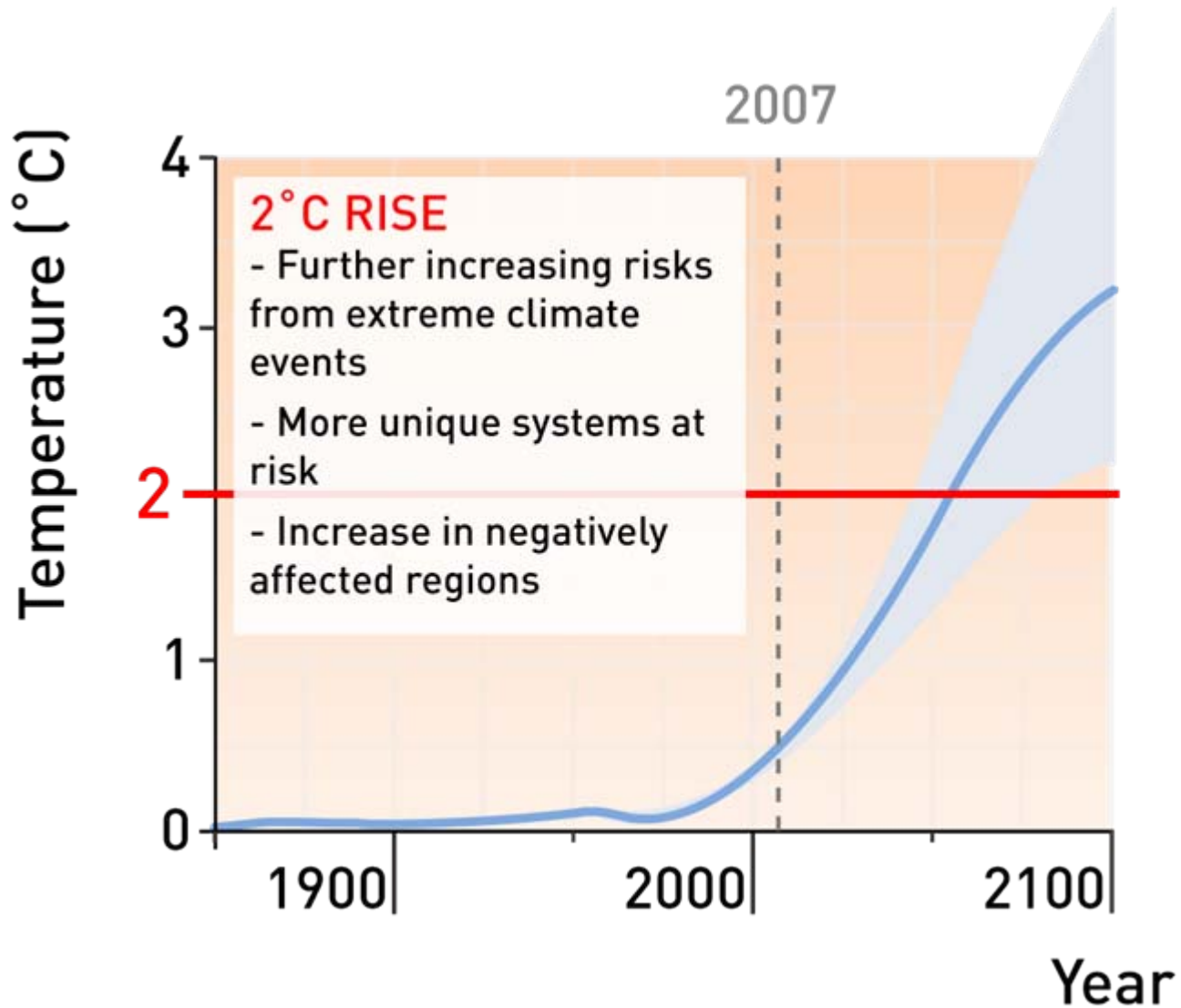
(outgoing) Director, Global Freshwater Programme,
WWF (jpittock@wwf.org.au)

10th International Riversymposium & Environmental
Flows Conference, Brisbane, 3rd September 2007





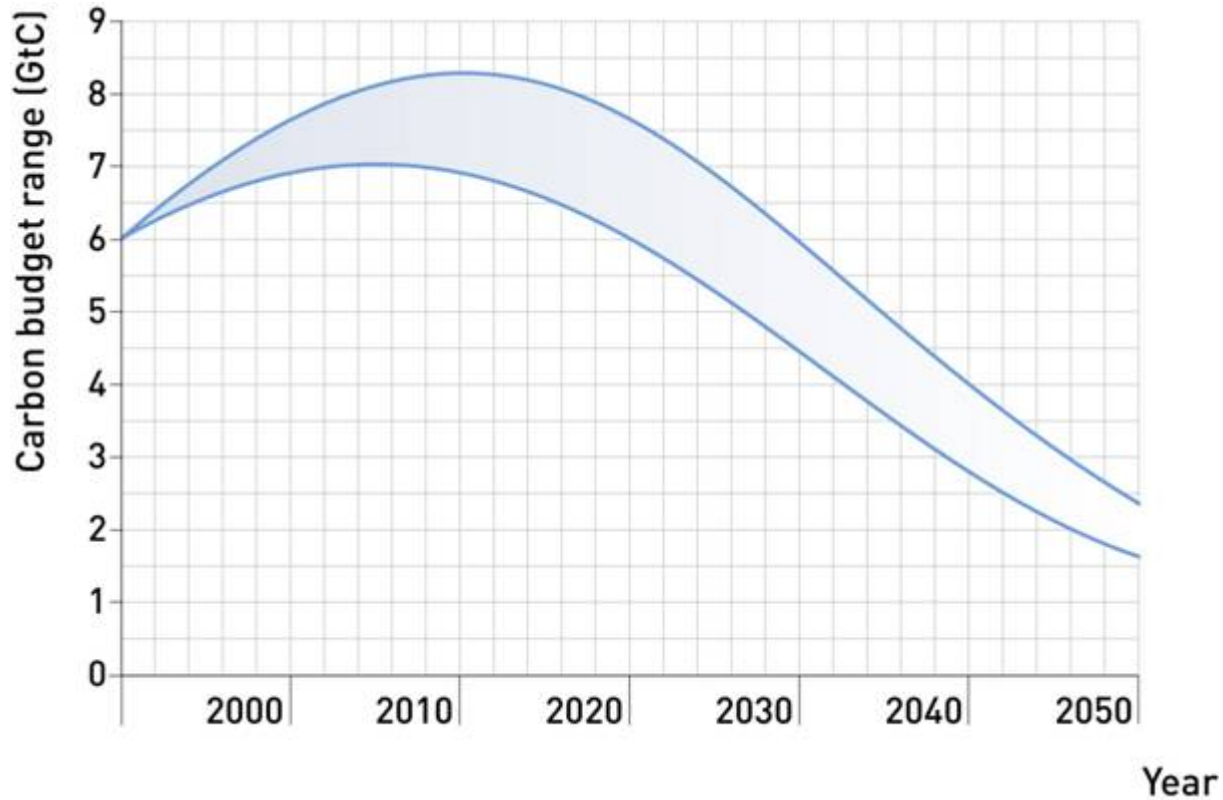
The Consequences of Global Warming





Carbon Budgeting

- Carbon budget = 400 - 500 GtC





A Common Goal for Energy Policy

- A common goal for energy policy:
 - Meet projected global growth in demand
 - Avoid dangerous impacts of climate change
 - Use only socially and environmentally benign sources





The Basis of the Climate Vision for 2050

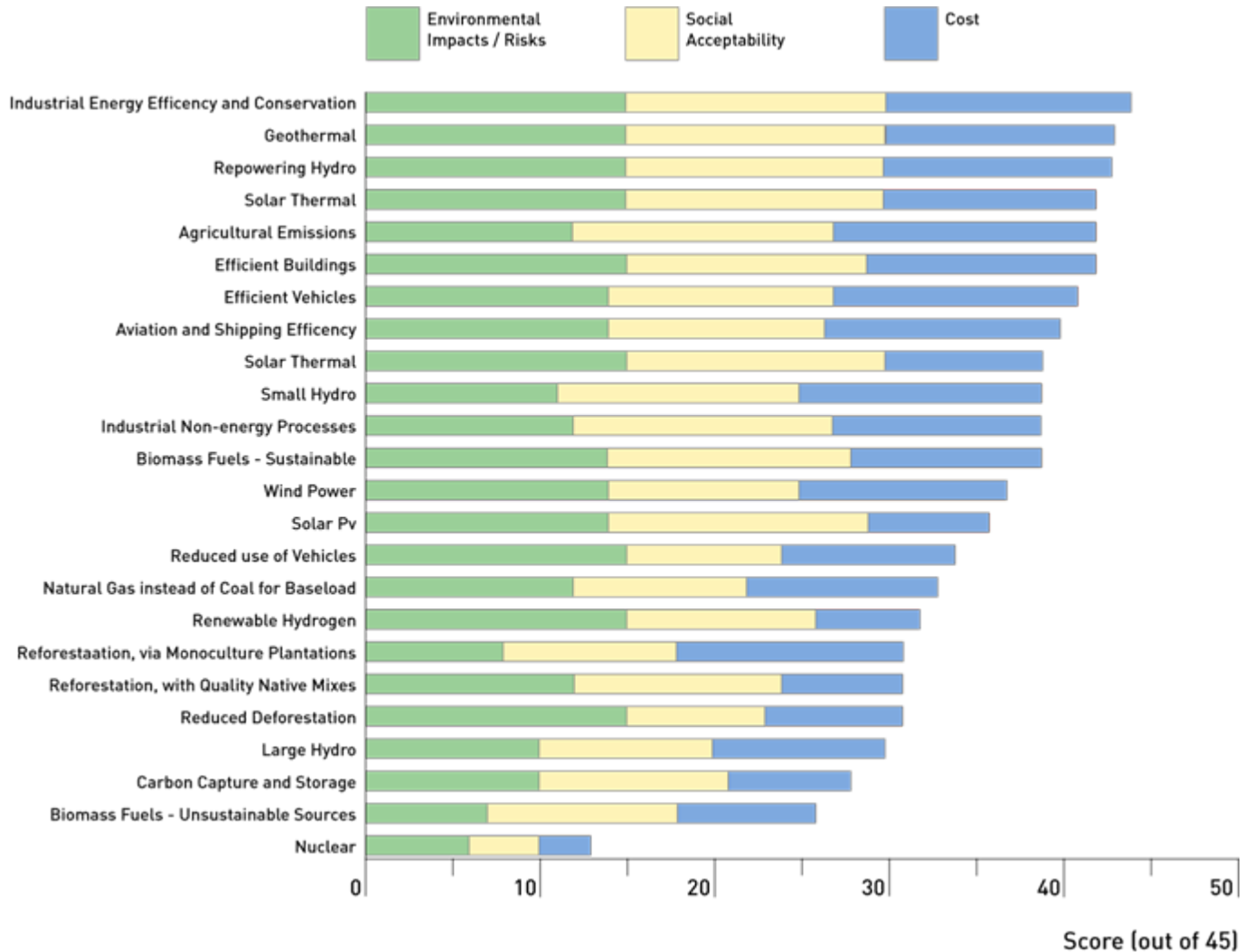
Newly designed WWF Climate Solutions Model

- Uses probabilistic risk management tools
- Tests plausibility and time constraints of deep GHG emissions cuts
- States conservative estimates of projected growth
- Built on existing scientific literature





Reviews of 25 sustainable sources of energy





WWF grouping of climate solutions technologies

Industrial Energy Efficiency and Conservation

Efficient Buildings

Efficient Vehicles

Aviation and Shipping Efficiency

Repowering Hydro

BENEFITS →→
DISBENEFITS

Sustainable Biomass

Wind Power

Solar PV

Solar Thermal Power

Solar Thermal Heat

Small Hydro

Geothermal (heat and power)

Tidal, Wave and Ocean Technologies

Hydrogen from Renewables

Large Hydro (existing plus sustainable)

Carbon Capture and Storage

Natural Gas displacing Coal

BENEFITS →
DISBENEFITS

Unsustainable Biomass

Unsustainable Hydro

Nuclear

BENEFITS ←
DISBENEFITS

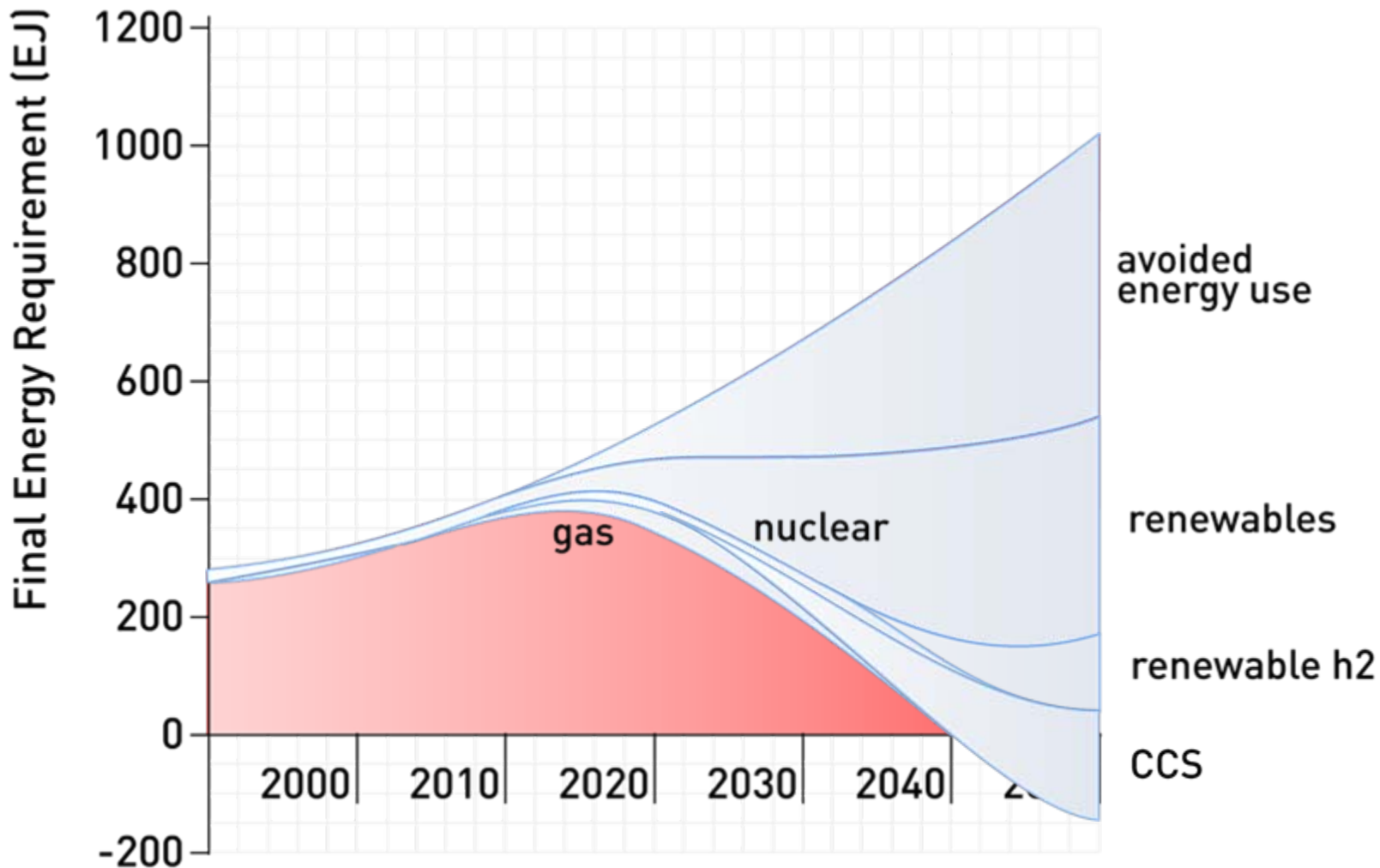


Six Key Solutions

- 1. Decoupling energy services demand from energy production**
- 2. Stopping forest loss and degradation**
- 3. Accelerating development of low emission technologies**
- 4. Flexible fuels, storage and infrastructure**
- 5. Displacing coal with natural gas**
- 6. Moving on 'carbon capture and storage'**

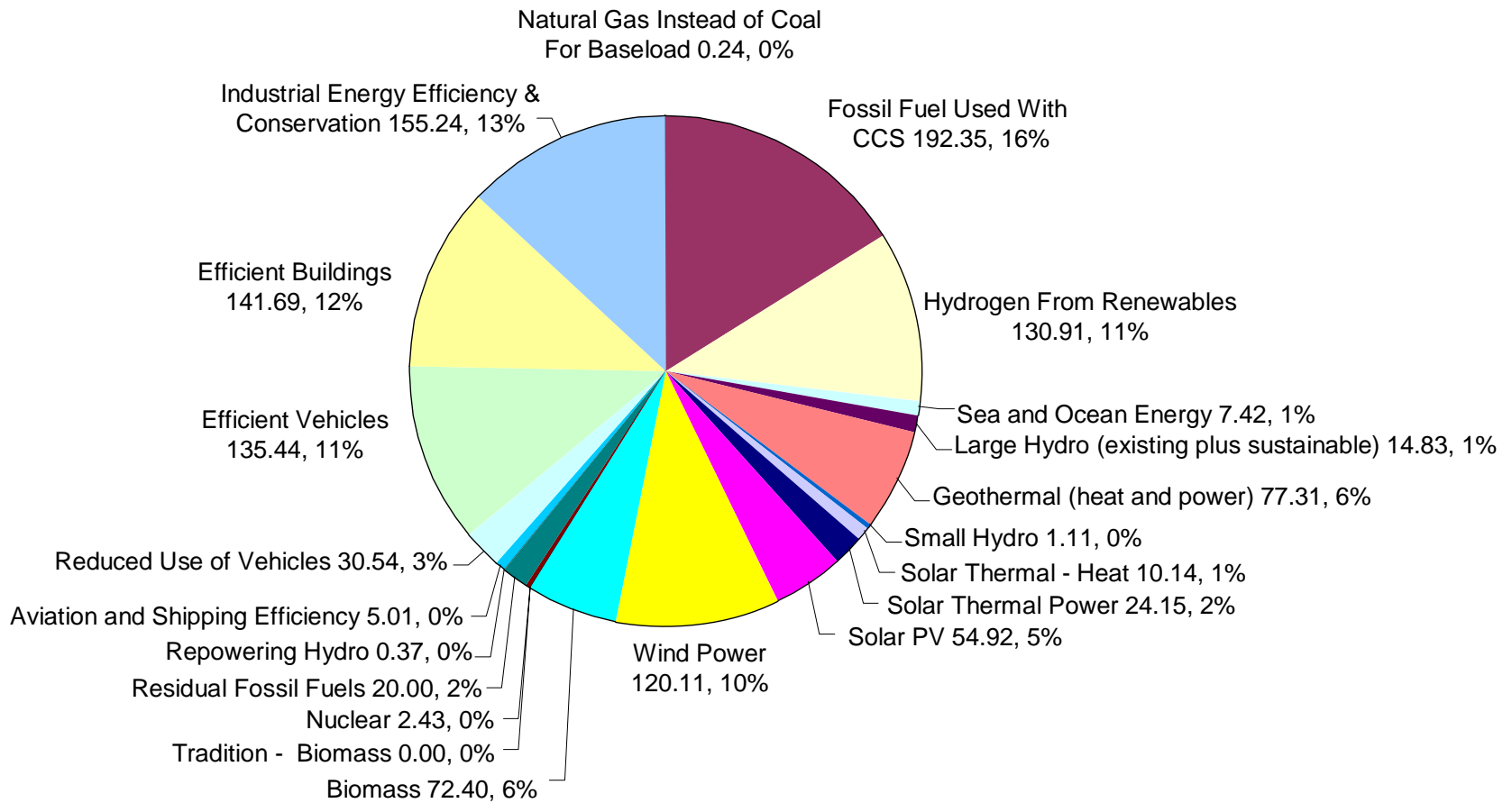


Output of Climate Solutions Model





Supply mix of emission reductions





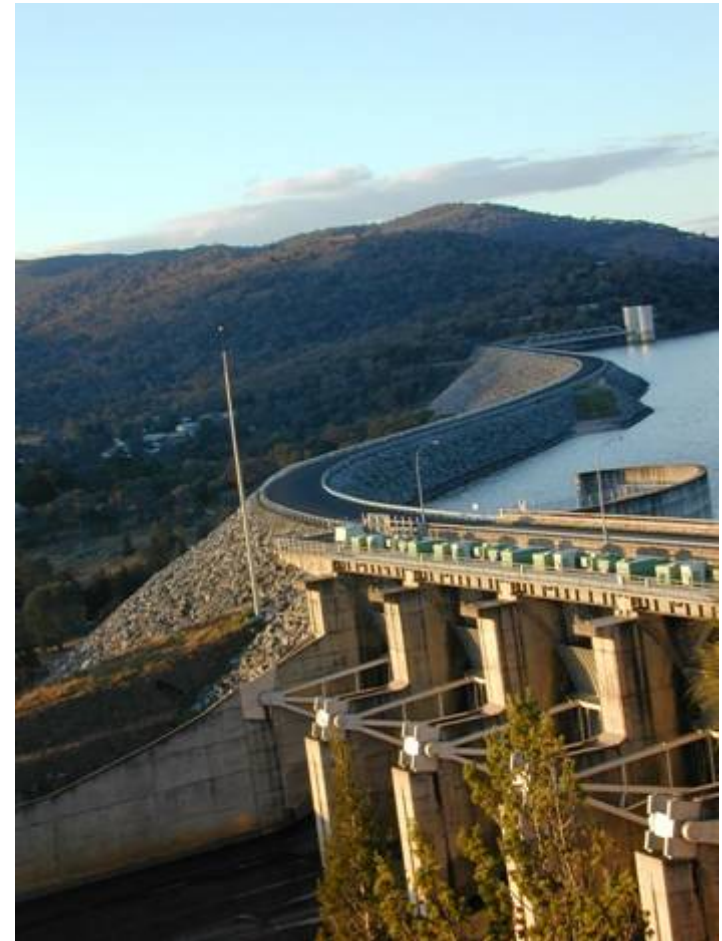
Role for hydroelectricity – retrofitting

- **Upgrading existing dams: + 30 GW**
- **Based on 10% increased production between now and 2025 on 20+ year old dams on ICOLD register**
- **Can quickly increase capacity at low cost, and offset emission from other sources**
- **Opportunity to reduce social and environmental impacts**



Role for hydroelectricity – new small hydropower

- **New small hydro:
+ 100 GW**
- **Current rate of
+2 GW/yr over next
50 yrs**
- **Has environmental
impacts that need
management**





Role for hydroelectricity – new medium & large hydropower

- New medium & large hydro: + 270 GW**
- More than 120 GW under construction**
- Less than 445 GW planned**
- Focus in countries (~38) that have developed <30% capacity**
- Major environmental & social challenges: must meet WCD guidelines – not a licence to build any dam**



Findings and Conclusions

- 1. Urgent global leadership & action is required**
- 2. 60-80% reductions in climate-threatening emissions can be achieved**
- 3. High probability of meeting projected doubling of global energy demand**
- 4. Known resources and proven technologies**
- 5. Modest role for hydroelectric power projects that meet sustainability guidelines**

More information: www.panda.org > freshwater / climate