Changes to be made to FRIDA for DERPs:

1. Energy supply damages (thermo & hydro)

Just remove other structure, turn variables into external timeseries.

We want ours to decrease from 1; so ignore the baseline factor (is this ok?)

How does this tie into the shares cooled by rivers & in secondary fossil energy?

What happens post 2070? Assume constant for now – but this means assuming to 2150.

Assume damage is zero before 2020.

Use multiple = 0 for the baseline (ie no impacts).

1. CDDs

Excel file has by regions – sum over these (region column; 3-letter labels) to give global totals. Use GCAM eroded sheet – numbers are the same as the other scenario. Use the columns where “GCAM region” is null – is this right? – update: yes, except have to add in China as well since this isn’t split up in GCAM (have generalised in code).

Feed magnitudes (not percentages) to “Change in energy used for cooling due to climate change”.

Are the units in the csv definitely GJ/(Person\*Year) as in FRIDA? Values are substantially higher than in FRIDA – update: are EJ/year; have implemented.

Assume damages apply for the decade starting with the associated year (ie 2030 value applies 2030-2029), and 2100 until 2150 – is this right? - yes

CDD is used to drive HFC emissions – have left this link on (and separate now from the resultant energy demand) but is this right?

1. Upper Bound on Total Capacity

We don’t track capacity as a stock for fossil fuels; we track capital (in $), split by Extraction and Energy (the former being larger), by source (Coal, Oil, Gas). We do have capacity for Nuclear, Wind, Solar, Hydro. Bio-energy is separately in Mt of fuel/year – a kind of capacity but not as GW.

We could impose the limit on these stocks aggregated separately over fossil (in $), non-fossil (in GW), and bio-energy (Mt/year)? Or impose them on the individual sources individually? – update: the protocol is to apply limits to additional capacity of the sources damaged by impact 1. We do this by targeting the “**desired investment**”, since a limit on investment directly translates into a limit on added capacity. For hydro this is fine; we can apply this to the whole sector, since the whole sector is affected by this reduction. But for the others, we have the issue that only a fraction of the power is affected by the impact. We don’t separate this out in the investments, so we have to cap the total investments into the fuel. Is this OK?

We split investments into extraction and energy capital separately (for fossil fuels); so we limit these additions separately.

1. Increased thermoelectric capital cost

We currently have an energy infrastructure damage function, which reduces the “capacity” stocks set out above. Should this be removed therefore?

* + Increased tech cost
* Switches for new impacts to go between scenarios & baseline
* Adjust policies in altered model to be close to NDC scenario – initially in median, then check with ensemble