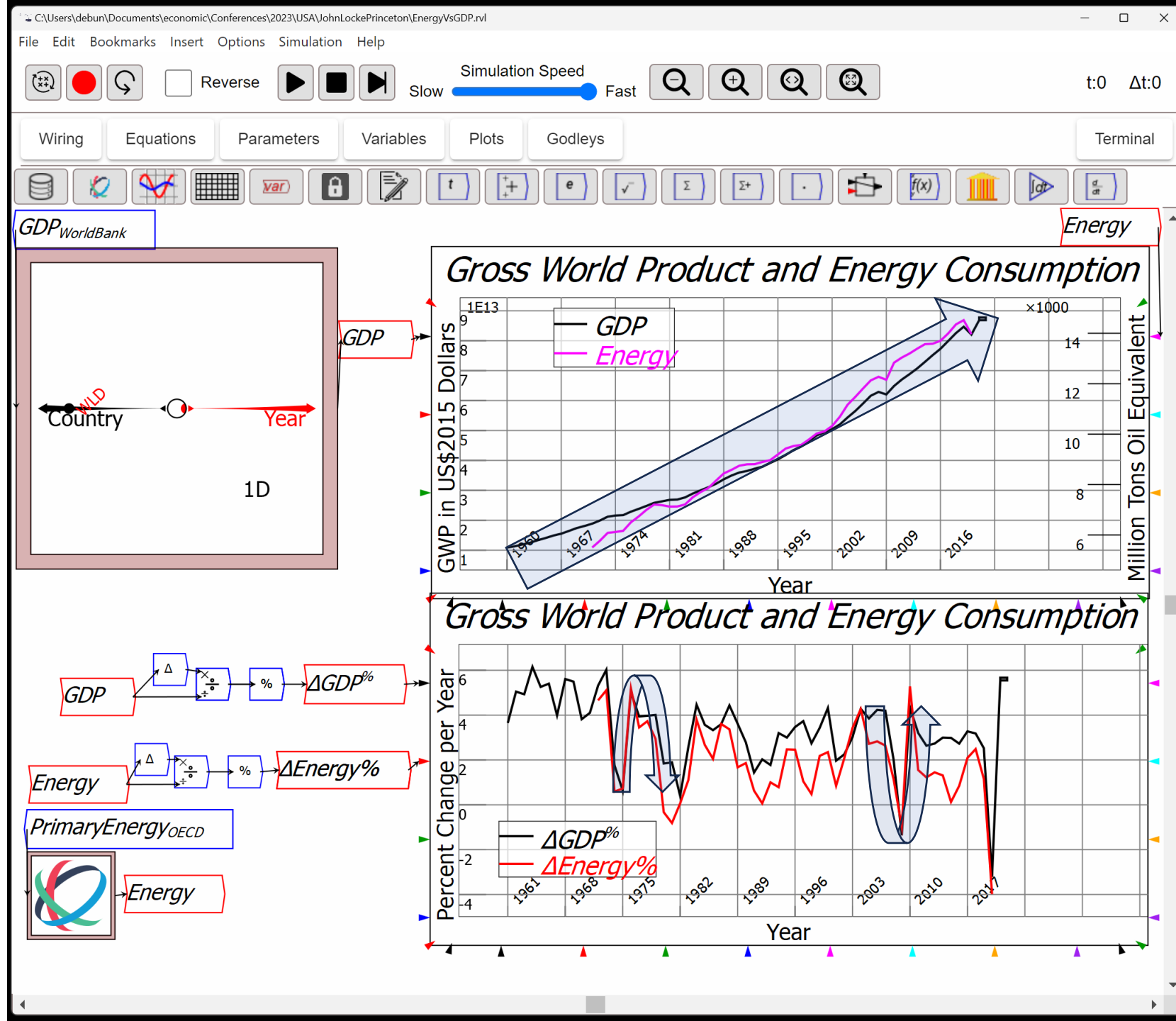


GDP is Energy

- At the global level
- There is a 1:1 relationship between Energy and Gross World Product (correlation 0.997)
- Correlation of Change in Energy and Change in GWP is 1:1 too (correlation 0.86)
- From the data, **GDP is Energy** (converted into useful work)
- This is the Leontief (Post-Keynesian) model of production



Neoclassicals reject this empirical fact...

- Because it conflicts with Neoclassical theory!
 - “if the elasticity of substitution between brown energy and other inputs is literally zero (Leontief) then production falls one-for-one with energy supply” (**True!**)
 - “The strict Leontief case makes **nonsensical predictions** with regard to the evolution of marginal products, prices and expenditure shares.” (**But it’s true...**)
 - “**If ... factor prices equal marginal products**, this then implies [a number of nonsensical predictions]
 - We consider these predictions to be economically nonsensical.” (**They are!**)
- But it’s true that “production falls one-for-one with energy supply”. Therefore...
 - ***The Neoclassical theories of both production and income distribution are false***
- Own-goal congratulations to Bachmann et al. (2022). “[What if? The macroeconomic and distributional effects for Germany of a stop of energy imports from Russia](#)” **ifo Schnelldienst** 75(Sonderausgabe April, 06-14).

Neoclassical models blinded us to climate change

- Neoclassical models production as requiring technology, labour & capital but no energy
 - “for the bulk of the economy—manufacturing, mining, utilities, finance, trade, and most service industries—it is ***difficult to find major direct impacts of the projected climate changes over the next 50 to 75 years.***” ([Nordhaus 1991](#))
 - William Nordhaus— “Nobel” Prize winner for economics of climate change
 - Neoclassical Consensus on climate change ([Howard and Sylvan 2021](#))
 - 5°C warming by 2130 and 7°C by 2220 would reduce economic growth by 0.02% p.a.—well below the measurement error level for ***recorded*** GDP growth today
- Energy reality:
 - “Labour without energy is a corpse;
 - Capital without energy is a sculpture” ([Keen, Ayres et al. 2019](#))
- Ignorance about energy causes belief in minor damages from global warming
 - Scientists: “dangerous warming ... categories...: >1.5°C as dangerous; >3 °C as catastrophic; and ***>5 °C as unknown, implying beyond catastrophic, including existential threats.***” ([Xu and Ramanathan 2017](#))