

Economic Trade-offs of Clean Energy Investment

Joseph Curtin¹

¹ Department of Economics & Finance, College of Business, Louisiana Tech University



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Question

What economic effects are generated or lost from switching away from fossil fuels in Louisiana?

The fossil fuel industry has declined in Louisiana in recent decades, but much of the local economy still depends on this industry. With concerns over climate change growing, it is apparent that substitute energy production methods are needed. In Louisiana, this could mean economic turmoil if the wrong industry is substituted.

Who is interested in the answer to this question?

- Policy Makers
- Business Owners
- Landowners
- Employees in Each Industry
- Louisiana Residents

Methods

The following industries were selected for comparison:

- Fossil Fuel
- Hydroelectric
- Nuclear
- Solar
- Wind
- Biomass
- Geothermal
- Other

A Type SAM Multiplier was used (with SAM standing for Social Accounting Matrix). These multipliers estimate the indirect and induced effect for a marginal increase in output. Each multiplier was calculated by dividing the total effect by the direct effect. The multiplier was then split into the direct, indirect, and induced effect for the graph.

These multipliers estimate the effects of a change in each industry, showing which would have a greater impact in the Louisiana economy.

Data

IMPLAN was used to estimate the effects used to create the multipliers seen in figures below. Multipliers were created for Output (Figure 1), Labor Income (Figure 2), and Employment (Figure 3) to give an idea of the effects of each industry in these areas of the economy.

Note: There is no data for geothermal energy production in Louisiana, so it is left blank in all figures.

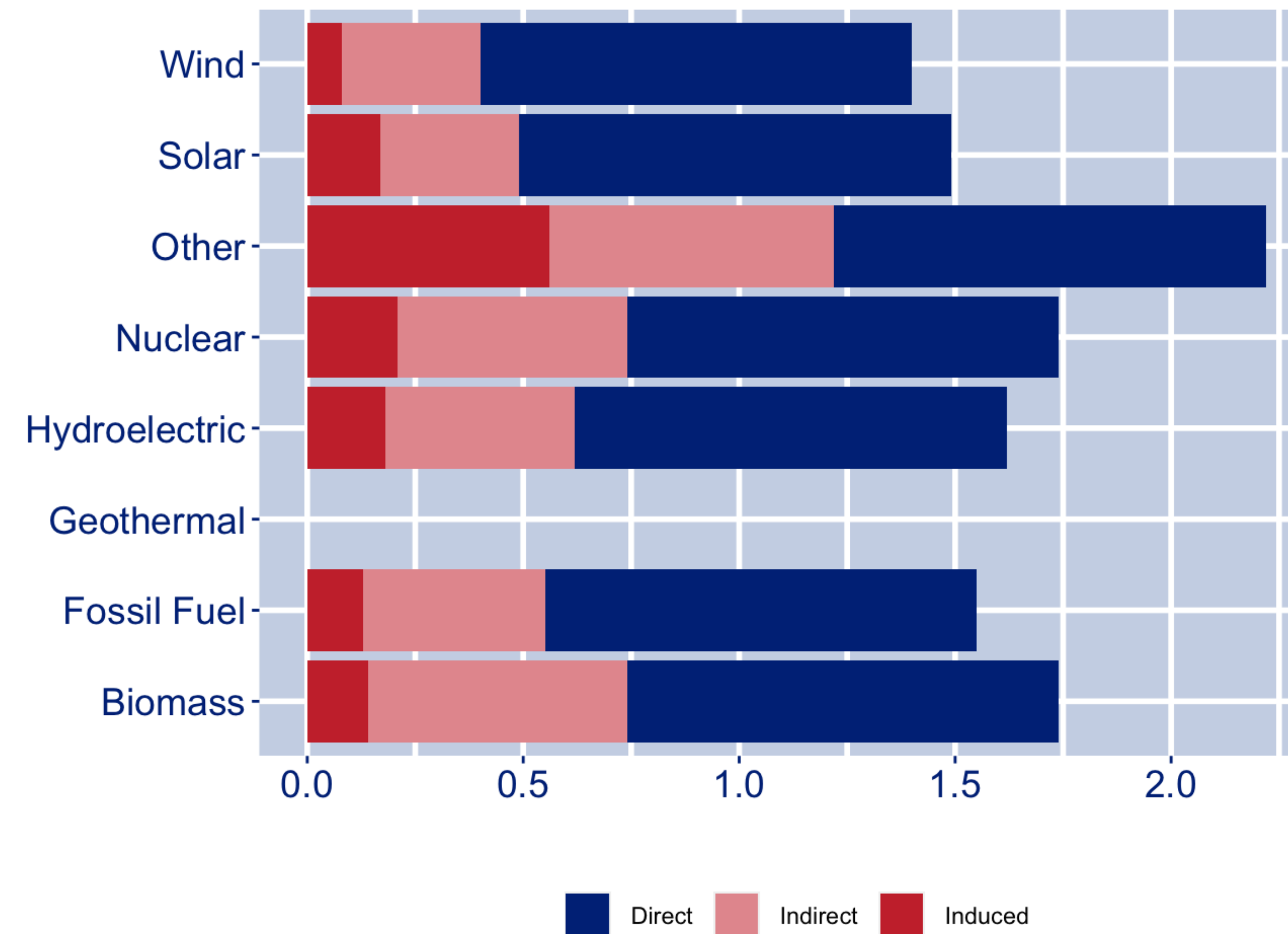


Figure 1: Shows multipliers for output. Indirect and induced effects for output are relatively low across industries compared to Labor Income and Employment multipliers.

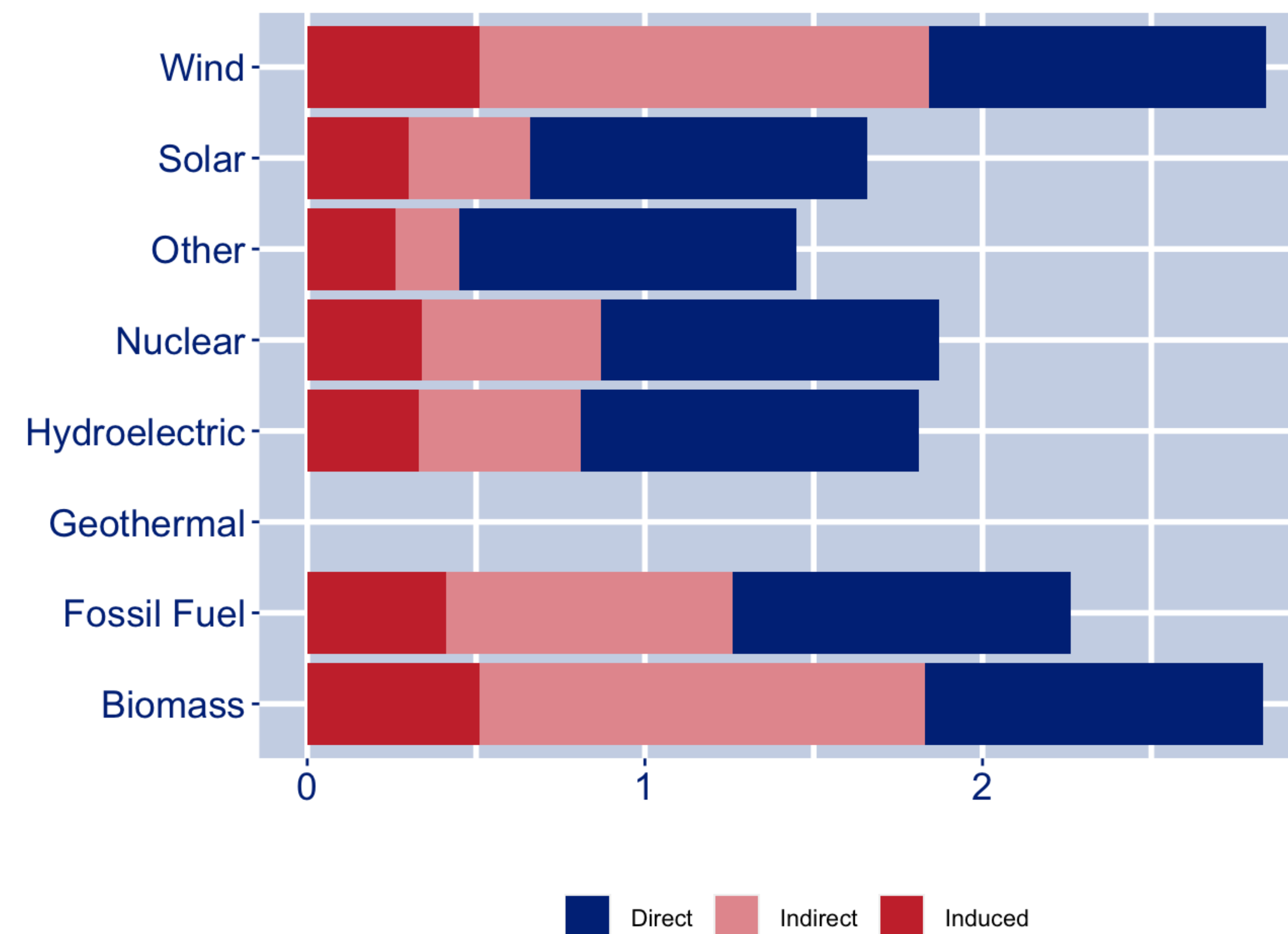


Figure 2: Shows multipliers for Labor Income. Multipliers for indirect and induced effects are better than those for output. Wind, biomass, and fossil fuel stick out as having the best multipliers here.

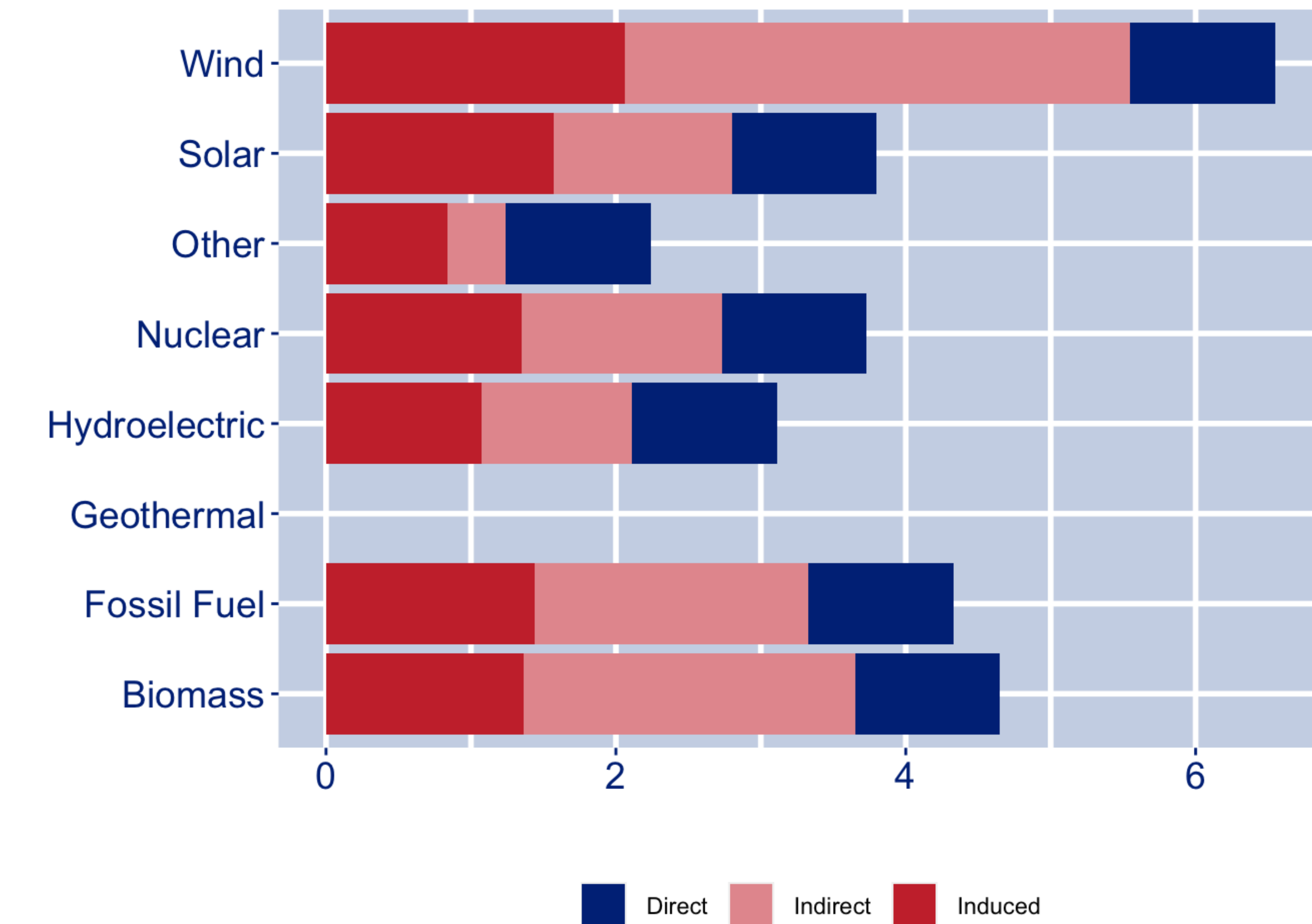


Figure 3: Shows multipliers for Employment. These multipliers are better than those for both output and labor income. Wind, biomass, and fossil fuel have the best multipliers here as well.

Results

Overall, employment and labor income are most affected by shocks in this market. This is important to note when deciding a substitute, since what may be a viable alternative from the employment or labor income perspectives may not actually push the state further down the road to efficiently phasing out fossil fuels.

Wind has relatively high multipliers for both employment and labor income, but has relatively low multipliers for output, signaling that it may not be as efficient. Similarly, biomass also performs well in both employment and labor income, and actually does relatively well in output. However, biomass involves burning plants instead of fossil fuels, so the amount of carbon released is not much better than burning fossil fuels.

The industry with the most balanced multipliers is nuclear. While nuclear is middle of the pack for labor income and employment, it maintains that status while sacrificing relatively less output when compared to other industries. Nuclear energy production can be controversial for a few reasons (chiefly safety and waste related concerns), but from an economic standpoint this seems to be our most viable option at this time.

Conclusion

From an economic standpoint, nuclear is the most viable substitute for fossil fuels that maintains a reasonable level of output, creates clean energy, and sacrifices less labor income and employment than other alternatives.