 This summer, The Emmett Center at UCLA jointly sponsored with the Union of Concerned Scientists a two-day workshop on unconventional oil and gas production technologies, aka fracking: two days of expert working groups on science and risk assessment, law and regulation, and public information and engagement, followed by a public forum. The public forum was pretty contentious (the working groups less so), on all the issues dominating debates over fracking nationwide, including debates over the California fracking law signed by Governor Brown last week: groundwater contamination, water withdrawals, treatment and disposal (and composition disclosure!) of fracking fluids, methane emissions, etc.

Much of the discussion asked questions of the form, “Is fracking better or worse than conventional production?” But thinking over the discussion, it increasingly struck me that this is an unhelpful and too narrow way to pose the question. The reason is that big advances in energy production technologies have widely different effects at different scales, with implications for the risks posed, the appropriate response, and the available legal and regulatory tools. And there is a lot of unnecessary confusion when people argue about one type of effect but are mainly concerned about (or are intentionally avoiding addressing) another.

The first type of effect (let’s call them “Type 1” impacts) is immediate, driven directly by the choice of production technology, and local. You see it in standardized comparisons between fracking and conventional production technology: to produce a given amount of gas or oil, how do the air, water, land, and climate impacts compare between conventional and unconventional (fracking) technology? The answer varies with the location, the geology, the precise methods used, and the regulations in place – and it’s a moving target since technology, practice, and regulation are all changing. But it looks like the rough answer is that fracking is worse on some dimensions, better on some – and pretty much the same on

many, since many problems identified from unconventional wells come from risks (e.g., well casing failures) that are present with both conventional and unconventional production. And to the extent that unconventional wells have worse impacts, many of these – not all – can be addressed by appropriate regulation and permitting requirements, as are underway in multiple states and federally.

Many arguments about fracking keep circling back to this type of effect. Proponents appear pleased to frame the arguments in these narrow terms, where they often have a pretty strong case that fracking is, or need be, no worse than conventional production. The trouble is that these arguments ignore the two other types of effects, which are less direct but likely to be far larger than these local direct effects.

The second, "Type 2", impacts are immediate like Type 1, but differ in two ways: they have large spatial scales (i.e., they are not local or site-specific), and they are driven not by fracking technologies themselves, but by their effects on energy markets and resources. Fracking is making huge expansion of exploitable gas and oil resources, with corresponding drops in price. This is what is driving the gas boom, underway right now in the US and coming soon to the rest of the world. Cheap gas is displacing coal in electrical generation (probably good for slowing climate change), and also displacing or slowing investments in renewables, efficiency, and nuclear (clearly bad for slowing climate change). Fracking is also bringing production booms – in gas, and soon in unconventional oil – to places that don't presently have oil or gas production. Do you want an oil well next door? This is a big reason for the intensity of local opposition. It's also the reason that arguing that a fracked well is no worse than a conventional well misses the point: many of the places where people are objecting to fracking didn't have conventional wells, and wouldn't have them without fracking. And it's also the reason so much fracking regulation is in catch-up mode. Moving production to new places means moving it to places where relevant regulatory authorities – in the US, this mostly means State governments – haven't previously had to do much oil or gas regulation but are now facing big surges of production.

The third, "Type 3," impacts extend the Type 2 impacts over time. Unconventional production technologies expand resources and depress prices not just now, but over an extended period. The current situation – more and cheaper gas and oil than expected, bring price pressure that slows deployment of non-fossil technologies – could well continue through much of this century. As a result, current scenarios of future greenhouse-gas emissions may be substantially too low, and the long-awaited transition to climate-safe energy technologies – via whatever combination of efficiency, renewables, or nuclear – may keep getting delayed, with grave results for climate change.

What's the point of separating these three types of effects? For one thing, it helps show why fracking proponents and opponents so often seem to be talking past each other. It also points out the limitations of regulations, even effective ones, that specifically target unconventional technologies and their local impacts, if larger-scale environmental impacts of energy-market trends are not also addressed. Regulation of the process and impacts of drilling and production can't readily address these effects: they take larger-scale policies, targeting the bigger environmental effects at issue.

Finally, distinguishing the three effects shows the peril of relying on market-driven energy transitions – i.e., relying on "Peak Oil" coming soon – to solve environmental problems. At the workshop, one participant said we didn't need to worry about Type 3 impacts, because we can still make the transition to climate-safe energy with an appropriately rising carbon tax. Sure we can. But to drive the transition with a tax or equivalent policy when market signals (ignoring environmental impacts) are saying "Woo-hoo, cheap energy!" will take a measure of political and public will that we haven't yet seen – to enact the tax, resist pressures to gut it with exemptions, and ramp it up over time to drive investment into climate-safe energy sources. This will be a lot harder, analytically and especially politically, than counting on resource depletion and price increases to solve the climate problem for you.

Output from the joint UCLA/UCS summer workshop is posted by UCS here.