

Florida will be hard hit by MACT

The EPA's proposed MACT Regulations for utility emissions will, according to a study carried out by consultants MISI for an association of Florida utilities, have a disastrous impact on output and living standards in the state, and by implication in other states too.

Roger H. Bezdek, Management Information Services Inc., Washington D.C., USA

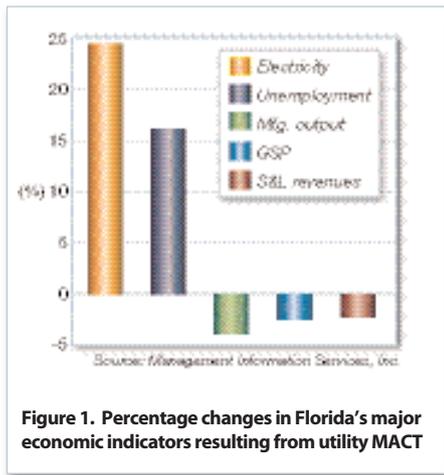


Figure 1. Percentage changes in Florida's major economic indicators resulting from utility MACT

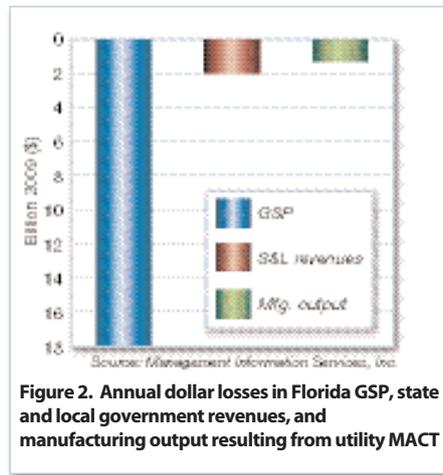


Figure 2. Annual dollar losses in Florida GSP, state and local government revenues, and manufacturing output resulting from utility MACT

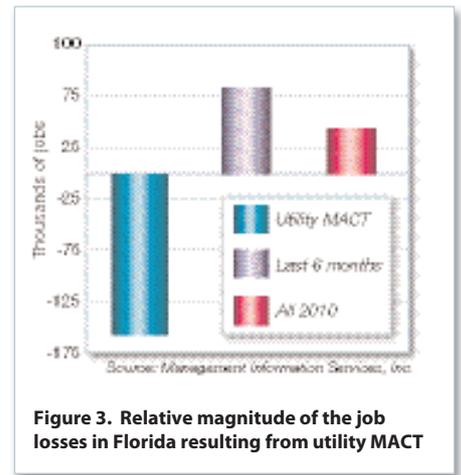


Figure 3. Relative magnitude of the job losses in Florida resulting from utility MACT

The US Environmental Protection Agency (EPA) is proposing Maximum Achievable Control Technology (MACT) regulations, and revisions to the New Source Performance Standards, for coal and oil fired electric utility steam generating units under the Clean Air Act. These Utility MACT regulations are highly controversial and could result in significant impacts on coal power plants, electric reliability, electricity rates, and the national and state economies. The following is a summary of the results of a study of the potential impacts on Florida of the Utility MACT regulations conducted for the Environmental Committee of the Florida Electric Power Co-ordinating Group.

Methodology

MISI has developed a methodology that permits the estimation of the impacts on the economy, jobs, and other variables of changes in energy-related parameters, specifically electricity prices, and this was utilised to estimate the potential impacts on Florida from the Utility MACT. There are several major underpinnings to the MISI methodology.

The first and most basic assumption is that energy and energy prices – specifically electricity and electricity prices – matter to the economy and that, in general, more abundant, efficient, and less expensive electricity is desirable and preferred and that it provides significant economic and jobs benefits. Electricity is a mainstay of the US economy and a critical factor of production, so this assumption is straightforward and non-controversial.

Second, to quantify the relationship between electricity prices and the economy, the elasticity of GDP with respect to electricity prices is utilised. Review of the literature indicates that a reasonable long run value for this elasticity is

about -0.10.

Third, the methodology posits that the mix of electric generating capacity – existing and new -- among the various fossil, nuclear, and renewable sources will significantly affect electricity prices. Estimates of the levelised cost of electricity (LCOE) of existing and new electricity generating technologies vary by orders of magnitude. LCOE is the constant dollar electricity price that would be required over the life of a plant to cover all operating expenses, payment of debt, accrued interest on initial project expenses, and the payment of an acceptable return to investors. Levelised costs are used to compare different technology options to satisfy a given duty cycle requirement, and levelised costs for different technologies can be evaluated using appropriate capacity factors. LCOE is a standard, widely used basic metric for estimating the economic and rate impacts of alternate electricity generation scenarios. Coal has the least expensive LCOE, followed by natural gas. New builds of nuclear and renewables are the most expensive and, among renewables, geothermal and biomass are the least expensive, followed by onshore wind, offshore wind, solar thermal, and PV. The study utilised estimated changes in the cost of electricity resulting from the EPA Utility MACT regulations.

Fourth, the methodology assumes that there is a quantifiable relationship between economic activity and jobs – between the level of GDP and jobs. This is relatively non-controversial, although the nature of the relationship is contentious. Here, for convenience, we assume that the relationship is linear, but changes over time as productivity increases.

Finally, the methodology was developed to assess the impacts of replacing exiting coal-fired generating capacity with retrofitted capacity or

with various alternatives – primarily new natural gas and renewables.

The basic MISI estimation approach is as follows. First, changes in the electricity costs within a jurisdiction (national or state) are simulated. Second, the change in GDP/GSP is calculated using a price elasticity factor applied to the change in electricity price. Increased electricity prices will reduce GSP and decreased electricity prices will increase GDP/GSP. Third, the effects on other economic parameters (jobs, tax revenues, etc) are estimated on the basis of the GDP/GSP impacts.

The salient point is that existing coal plants produce inexpensive electricity and modifying them with retrofits (or replacing them with higher cost natural gas and renewable facilities) will, inevitably, cause electricity costs and rates to increase significantly. The MISI methodology and database were used here to estimate the impact of such changes on electricity prices, GDP, jobs, and other economic variables in Florida.

National Impacts

Over the past two years, a number of studies have been conducted of the potential impacts of the Utility MACT and EPA's proposals on the US electricity system and economy. These studies indicate serious potential impacts, they identify the Utility MACT regulations as among the most troublesome, and many of them recommend delay or reconsideration of the EPA regulations.

Despite the caveats and concerns contained in the studies, the weight of evidence indicates serious energy and economic implications from the EPA regulations. The studies estimate that as much as 100 GW of coal-fired capacity could be affected, compared to a total coal-fired resource base of approximately 340 GW and an

estimated 1045 GW base of generating capacity in the US in 2015. The parts of the country with potential exposure to relatively high retirements in response to the air regulations are the regions with a high percentage of coal plants (especially older plants) and with lower existing reserve levels. The studies estimate that the costs of these regulations could total nearly \$30 billion per year and that electricity rate impacts could be well into the double digits. Further, nationwide, between 2 and 3 million jobs could be at risk.

Summary of findings for Florida

Florida generates about 25% of its electricity from coal (the US average is 47%), about 54 % from natural gas (20%) and about 13% from nuclear power (22%).

- MISI estimates that the EPA Utility MACT regulations in Florida would by 2015 result in:
- An average electricity rate increase of nearly 25%
 - Gross State Product (GSP) loss of nearly \$18 billion – about 2.5 % of state GSP
 - Annual job losses of 157 000
 - An unemployment rate of nearly 13 % – a 16 % increase
 - Lost annual manufacturing output of \$1.3 billion – nearly 4% of Florida’s total
 - Lost annual state and local government revenues of \$2.1 billion – about 2% of the total.

These impacts are illustrated in Figures 1, 2, and 3. Figure 1 shows the percentage changes in Florida’s major economic indicators, and is notable for the large percentage increases in electricity rates and the unemployment rate. Figure 2 shows the total annual dollar losses in GSP, state and local government revenues, and manufacturing output. Figure 3 shows the relative job losses. In fact potential job losses in Florida from Utility MACT are about twice the total number of jobs created in the state over the past six months and are nearly four times the total number created in the state in all of 2010.

These results do not consider many other costs that will result from the Utility MACT, including control equipment and monitoring equipment installations, capital, and annual operating and maintenance expenses; stranded investments from units that will be shutdown before the end of their useful life, and control equipment installations that may no longer be sufficient; adding or upgrading transmission capabilities; and differing impacts on municipal generating entities.

The state economy

Florida’s economy is currently struggling to recover from its worst performance on record, and the economic impacts of the Utility MACT on the state will hinder, and could even reverse, Florida’s current nascent recovery. The state’s economic situation is still precarious, and the last several years have been extremely difficult.

While there are glimmers of hope, the bottom line is that Florida is currently experiencing, at best, an anemic recovery from the worst recession in decades. Losses in the state resulting from the Utility MACT of \$18 billion in GSP and nearly 160 000 jobs may be sufficient to delay or derail this fragile economic recovery.

Business and commerce

The electricity cost increases resulting from the Utility MACT will place thousands of business throughout Florida at risk. Business owners in virtually every sector of the Florida economy – including tourist-related businesses – are

currently experiencing difficulties accessing affordable energy sources, and this is especially true for many small businesses that are high consumers of energy, including restaurants, bars, entertainment companies, small food stores, laundries and dry cleaners, bakeries, commercial stores, and manufacturing firms. Small businesses have identified energy costs as one of their most important concerns, and even though energy costs often represent only 5-10 % of total costs, they are important for small businesses because they can make the difference between profit and loss.

The Utility MACT regulations will increase electricity prices, and these price increases will have several adverse affects on the Florida economy and jobs. First, businesses currently located in Florida will face increased costs. Second, some businesses currently in Florida will leave the state to relocate to other states that have lower electricity costs. Third, some new businesses will think twice about locating in Florida. Fourth, and most important, electricity customers will have less money to spend on other things.

Certain sectors of the economy have become increasingly sensitive to even minor changes in electricity costs. For example, the healthcare sector – a major industry in Florida – finds that almost all provisions of services are related to energy costs, with hospitals using twice as much electricity per square foot than comparable office space. One study found that ‘electricity used exclusively for medical records is rapidly increasing, by 400-800 % in the past four years.’

State and local governments

As demonstrated by the devastating impact of the recession on state and local government budgets throughout the USA, government tax revenues are sensitive to downturns in economic activity. For example, the state of Florida has recently struggled with a budget shortfall of nearly \$4 billion. Revenue shortfalls persist even though, over the years since the recession took hold in Florida, the state has cut spending radically and closed shortfalls.

The Utility MACT will decrease Florida state and local government revenues by more than \$2 billion annually and thus exacerbate these budget difficulties. Over the five year period 2015 – 2019, the Utility MACT could reduce Florida state and local government revenues by more than \$10 billion.

The recession struck Florida early, and in a major way. Without an income tax, state government has long depended on property and sales taxes. However, since the Florida real estate industry has been devastated, the state’s annual revenues declined more than \$12 billion from a 2006 peak of \$74 billion.

Florida’s infrastructure funding problems are already acute and, since the state’s constitution requires a balanced budget, possible remedies are becoming increasingly severe. The bottom line is that Florida’s fiscal problems are serious and are worsening, and are causing hardship and controversy throughout the state. Nevertheless, there is probably one thing that all of the various parties involved can agree on: Florida does not need the loss of an additional \$2 billion annually in state and local government revenues that would result from the Utility MACT.

Those more vulnerable

Increases in electricity prices will affect all Florida residents, but they will be particularly troublesome for those with limited budgets (Figures 4 and 5). The electricity price increases arising from Utility MACT will act as a regressive tax on low income consumers, decreasing their discretionary income and economic well-being, and increasing their energy burden. This is going to be very hard on elderly residents, who already face a disproportionate energy cost burden (for example, more heating, to ward against temperature related illness) and this burden will be exacerbated by the regulations. Lower-income elderly households that depend mainly on fixed incomes are among those most vulnerable to energy price increases. Energy will be competing with other demands such as health issues and food on the table, and health and wellbeing may suffer.

The effect of higher prices will apply equally to other low income households, intensifying the difficulty of meeting the costs of basic human needs and endangering health and safety while creating additional barriers to meaningful low-income participation in the economy. While home energy costs average about 4% of middle class households, they can reach 70% of monthly income for low-income families and seniors. By virtually every measure of economic well being and security, African-American and Hispanic citizens are worse off than the Caucasian population, and they tend to be especially vulnerable to the economic downturn and the job losses likely to result from these regulations, which will have a disproportionately negative effect on their ability to acquire other necessities such as food, housing, childcare, or healthcare.

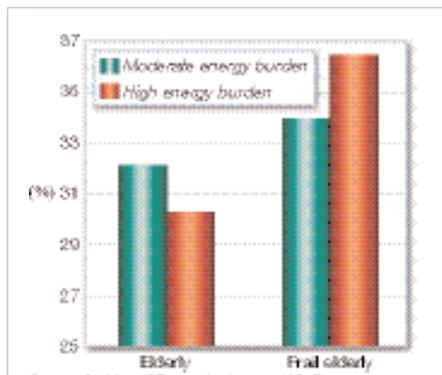


Figure 4. Total energy burdens on the elderly by percentage of state population

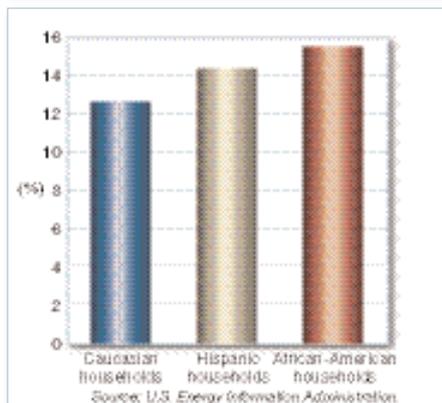


Figure 5. Energy expenditures in Florida as a percentage of after-tax income