

Energy Innovation

By Thomas A. Fanning

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I want you to imagine something, and that is a national energy policy where we can add 2 million jobs to the economy by 2020 – maybe 5 million jobs by 2030 to 2035. We would grow GDP faster, add to GDP growth by 2 to 3 percent per year for the next 15 to 20 years. We can provide – for the citizens we are privileged to serve – a balance of clean, safe, reliable, affordable energy.

We can do it in a manner in which this nation can become for the first time – in my lifetime, your lifetime and your parents’ lifetime – energy secure. Now, not independent, but we’ll become a net exporter by 2020. And by 2030 to 2035, we can become the biggest energy producer on the planet. I think that’s worthwhile.

Energy security breeds national security, which breeds economic security. And in these times of challenges and frozen government, my sense is the energy sector – with the innovation that’s happening and the economic value that will be generated – will provide our citizens a way to play offense successfully in this otherwise challenging environment. I think people are thirsting for that.

That’s why I think the Bipartisan Policy Center and the work here – bringing people in the middle together to create real solutions, create jobs, grow personal incomes – creates this unassailable advantage for our nation.

I talk about this a lot and I do it in the context of broad energy policy. But what I want to do here is focus on electricity. That is what Southern Company does. But getting electricity right is really important when you think about the data. Since 1970, the growth and consumption of energy, about 70 to 80 percent of that has been because of electricity – more than any other component of the energy sector. We truly are moving into a digital age. And so it’s really important to get this right. And I think we will.

When I talk about electricity issues, I typically do it in three segments. First, I used to say “all the arrows in the quiver.” President Obama says “all of the above.” But whatever you call it, it’s the full portfolio: new nuclear, 21st century coal, natural gas, renewables and energy efficiency.

Southern Company is doing all that. We’ve committed \$20 billion to making that a reality. In the process, we’re creating about a quarter of a million jobs.

The second leg of the stool – it is really important that we get this one right also – is we’ve got to restore America’s financial integrity. Electricity is one of the most capital-intensive businesses in the world. And what we need from an economic

standpoint is a regular, predictable, sustainable economic environment. Until we address the very important issues of America's financial integrity, I'm not sure we'll ever get there. We've got to do that.

The third leg of the stool, and my focus today, goes to energy innovation.

I want you to consider this as we go forward: That when you think about the tough kitchen-table economic decisions that the citizens of America make every day, why can't we as leaders do that too? And we know that with frozen government and with the competing politics of the day, it's folks like us who are going to come in the middle and provide real common-sense solutions. I think Americans deserve that, and that's why I take it so seriously.

Now, before I get into innovation in the electricity sector, I want to step back to another sector, and that is information technology. Earlier in my career, I spent some time as Southern Company's chief information officer, or CIO. And I can tell you that the challenges of that job are fascinating. But think about how much value has been unlocked by innovating in the IT space. You know, I grew up in the day when we had dial-up telephones. My son has no idea what you mean by "dial me," for heaven's sake. We went from mainframes to personal computers to all the wonderful devices that we're so addicted to right now.

And beyond that, Southern Company is leading my industry in doing robust, proprietary research and development. We also do a lot of visioning and innovating exercises and things like that. We really do go through rigorous processes to predict the future. And we did one some time ago where

we predicted the iPhone – we knew there would be this really versatile device that does X-Y-Z, and so on. What we missed badly was the importance, the variety and the interrelationship of the apps. And what I'm fascinated with is this idea of the analogue to the development of IT and the apps in the energy space. See, I think I'll be able to predict pretty clearly, with some variance, but I'll be able to predict the "whats." It's the "hows" that are really transformational and potentially disruptive.

And one last comment on disruption. Innovation is by its nature disruptive. Right? Now, sometimes it goes in a long sustaining manner. And everybody can kind of adapt and get along. But from time to time, disruption occurs that just changes the game – changes the "whats" and the "hows" and the markets and the way people think about and use the product you're talking about.



So what's fascinating to me as CEO – I am accountable for clean, safe, reliable and affordable energy all the time. And I've got to make sure, too, that as I satisfy customers – and that is our first mission – that I also provide for shareholders

and employees and make sure that we work constructively with all of our external publics. Sometimes innovation gets disruptive, and so what we've got to do is move together constructively for the benefit of the customers we're privileged to serve. In the event that it threatens our business model or our current way of thinking, we've got to adapt because you cannot keep the waves off the beach. And we know those waves are coming.

So now, what about innovation in the electricity space? I bet what's in your mind right now is all the home stuff and all the cool innovations there. I want to break it up again into a quick discussion of three segments:

Make – that is, turn a fuel stock into an electron.

Move – take that electron and send it to a customer.

And then – sell or consume.

Make, move and sell.

“Make” – in other words generating electricity – is where everything starts.



Hitting very briefly on the full portfolio again, innovation in this space is key and we continue to innovate. And probably the United States doesn't give itself enough credit for all that it does. But No. 1, we're pursuing the newest generation of nuclear technology in the world today in the state of Georgia and leading the nuclear renaissance. Nuclear in a carbon-constrained world must be a dominant solution. You may know about the federal loan guarantee program. That was very helpful to getting our project approved; we got a loan guarantee to support that. All the benefits of the loan guarantee go to our customers. We've got to continue that effort.

No. 2 is coal. The United States has about 27 percent of the world's coal reserves and they are darn good. I fully understand that the United States is moving away from coal. That's not true elsewhere in the world. And what we've got to do is work constructively to find ways to innovate on the issue with coal.

Everybody is focused today on carbon dioxide. Southern Company runs for the United States of America, on behalf of the Department of Energy, the National Carbon Capture Center. We also have developed our own technology for coal; we're deploying it in Mississippi. And via our technology, imagine this: We can take a resource that is otherwise going unused – native Mississippi lignite – we run it through our process, we create electricity, we strip out 65 percent of the CO₂, and therefore from a carbon footprint standpoint, this coal technology is cleaner than natural gas.

Here's something else – we put the CO₂ to productive use. In this case, it is used in something called enhanced oil recovery. We push it underground and push out more domestic oil

that otherwise goes unachieved, and will develop, once this plant goes into service, we think another 2 million barrels of oil every year. More electricity, more oil, more energy security, more tax base, more jobs. That's the kind of thinking we need to do more of here in the United States around coal. We've got to figure out a way to use the blessings that this nation has.

Thirdly is natural gas. I think this revolution we've seen in natural gas is because of technology innovation, the drilling technology that will allow us now in an economic way to obtain supplies of natural gas that otherwise are not economically attainable. And so that's been exciting. Southern Company moved from developing 70 percent of our electricity from coal, down to 38 percent. Natural gas used to be 16 percent; it increased to 42 percent. Southern Company is now the third-largest consumer of natural gas in the United States. It's been great for the environment, great from a price standpoint.



But natural gas is not a panacea. We have to find ways to incorporate gas into the portfolio, but it is not the only answer. There's a lot of important work to be done to make sure that the other important parts of the portfolio work well with natural gas.

The fourth element of this idea of "make" deals with renewables. Southern Company is one of the largest solar photovoltaic owners in the United States. I've always been bullish on solar. Not so much on wind. Wind certainly has its place; it's just not as practical in the Southeast. So I think costs for renewables are coming down; I think it's spreading. The state of Georgia has the largest voluntary renewable program for solar in the United States. I'm all in favor of it.

But here again, there are those who say we can solve all the nation's problems with only renewables and energy efficiency. And that's just not going to happen, certainly not in the near term. Renewables are an intermittent resource. What do you do when the wind doesn't blow and the sun doesn't shine? The backup generation resource is going to be natural gas and then you're doubling down on this big bet the nation is taking. And you're raising the risk, the volatility, of the price and supply of energy for the United States. That's going to have big consequences for manufacturing and consumers.

The other issue is that renewables get an enormous allocation of tax benefits far disproportionate to oil, natural gas or coal. And even disproportionate with respect to nuclear. I'm not so sure that's a sustainable policy. But believe me, I am all over renewables, especially photovoltaic solar. I think it is something that is so important.

The final thing is energy efficiency. The innovation around energy efficiency – when you think about

Nest and just a variety of CFLs and different kinds of lighting – it’s so important. We should always be good stewards of what we consume. But that doesn’t just mean use less. We talk about a strategy of playing offense and defense. Here’s my view: If I can bring the cost to output a unit of electricity down, then I bet I can convince the American economy to use more. And as we grow the economy, and as we improve the standard of living of the customers that we are privileged to serve, we will use more electricity. And I’ll say more about that point later.

If you look at the data for the Southeast, the numbers support electricity consumption growing in the future. That’s a good thing for America. You know, I love to finish my energy efficiency comments with this phrase: We should use less where we can, but use more where we should.



Moving to the last comment I’ll make on this idea of “make” is this: There are some really cool disruptors; one is distributed generation. I don’t particularly view that as a big disruptor; I view that as more of a natural evolution. I’m all in favor of distributed generation and what I mean by that – for those of you who don’t know that buzzword – typically it manifests itself as putting a solar panel on your house. You’re still going to need to be connected to the grid; you’re still going to need backup generation when the sun doesn’t shine. But I think the more disruptive potential is in storage. We’re doing deep research on storage.

So “make” is important. Next is “move.” Everybody talks about the smart grid. Southern Company has invested about \$7 billion over the past 12 years on smart grid-type things. Here again, what is involved is putting intelligence into the wires that serve the grid. And really what we’re doing, to describe it very simply, is sending micro-pulses out every second, and we’re doing two things as an output. One is, we’re developing a predictive capability in the grid. And two, adaptive capability.

The predictive capability is able to sense where there are growing anomalies in the grid so that we can optimize our maintenance capabilities to prevent outages from ever occurring. The adaptive capability is enhanced by the notion that when we lose a line – whether it’s a hurricane, tornado or some other natural disaster – we’re able to switch around and make sure that we keep the lights on as much as we can.

Here’s the bottom line: Over the past 12 years – from an interruption standpoint, from the frequency of interruption, from the duration of those interruptions when they invariably occur – we’re on a 12-year trend of improved performance.



And I know someone said some time ago, after the blackouts in the Midwest and Northeast, that we had a Third World electricity grid. I couldn't disagree more. The United States electricity grid is the best in the world.

The other way to think about "move" really culminates in this idea of smart meters. Southern Company has deployed about 4.4 million smart meters across the Southeast. And I know that there was great hope originally in this idea that smart meters would somehow revolutionize the gateway to the smart home. What they really do is turn a mechanical exercise and a highly hands-on touch exercise into a digital wireless exercise. And so, therefore, it's good for the environment and good for the economy. We have fewer trucks in the field, fewer people in the field and it's been very good.

Again reaching back to my CIO days, I am also concerned about cyber threats. In the U.S., I chair something called the ESCC – the Electricity

Subsector Coordinating Council. There are 16 of them under the umbrella of the Department of Homeland Security and we represent investor-run utilities, cooperative utilities and municipal-run utilities for all things – cyber terrorism, physical terrorism and natural disasters. We plan for and adapt to. And it's a very important role. Opening up the door to the electric network in an unfettered sense through smart meters is something that I want to personally be very deliberate about. And so I think the correct posture here is to be cautious.

Now let me go to the third segment and that is "sell." I've done "make," I've done "move" and now "sell." And it's "sell and consume." One way we think about consuming electricity is electric vehicles. For instance, there's Tesla. I think it's fabulous. It is a great car. And isn't it interesting that we can produce the equivalent gasoline price of about a buck per gallon by using electric vehicles. And as we improve the reliability, and as we improve the scope to drive on a single charge, this is going to have more and more penetration. And I'm excited about that.

We've also done off-road innovations in the ports of Savannah and Mobile. We have largely replaced diesel cranes with electric cranes. We saved every year about 7 million gallons of diesel fuel from being burned here in the United States. And we are instead using a United States resource, electricity.

The other thing that is fun is that when you fly into Atlanta – and everybody knows the joke that when you die and go to heaven you have to go through the Atlanta airport, the world's busiest airport – if you look out the window when you land, you will realize that most of the vehicles circling your aircraft and carrying your luggage are not gas or diesel; they are electric. And so these are some of

the things that we can do in a much broader sense across the United States.

But here's where things get really interesting. There's a lot of buzz around Nest. You know Nest is this adaptive behavior that when you go into your house and set your thermostat, your house will kind of know your patterns. Here's what I think the great thing is about Nest. I think Nest is another evolution; I think it's a disruptor around the corner. And it may be "son of Nest" or "daughter of Nest." I'm not exactly sure, but it's going to be this sensing technology. Sensors are developing to the point where I think at some point in the not-too-distant future, pick a number, our experts say any asset in your house worth a hundred bucks or more will have its own sensor. And now you're not so concerned with, for example, what the HVAC is doing. I think that every asset in your house will have the ability to manage its performance based on your behavior.

Some of you may remember when VCRs first came out and you saw those blinking lights when none of us knew how to program the thing. If there has to be human intervention on energy efficiency, I think it's going to be limited in its penetration. But I think with innovation and technology, turning data into information and knitting together the information into knowledge, we can create learning homes and learning businesses that will truly optimize, without human intervention, the consumption of energy. And I think that would be great for all.

So make, move and sell. I'm excited about that. I've given you a bunch of "whats." At the end of the day, what I really think are going to be as important as or more powerful than the "whats" are the "hows." I go back to my accountability as a CEO to balance

the notions of clean, safe, reliable and affordable. As we innovate for the benefit of the customers that we are privileged to serve, I always want to put a face on our customers, because it's easy for us in forums like this to get all wonky and go back in our offices and ivory towers and we think we know everything.

The reality in the Southeast is that 46 percent of the families we serve make less than \$40,000 a year. Those families make tough kitchen-table economic decisions every day, so why can't we? We cannot let frozen government persist. It is our obligation as leaders of whatever enterprise we serve to come in the middle and provide real common-sense solutions.

The families again, what do they want out of all this? They want for their children a better place to live, better food on the table, better medical care, better education, a better future. See, I think it's so exciting that the energy industry – the innovation that is now developing – can provide solutions for folks.

When I started this talk, I talked to you about "imagine this." I am convinced that a lot of the issues that I discussed and I think a lot of the potential in the future are nothing that we have to imagine. We can do it. We can already see the beginnings of many of these things. And I think, for the betterment of America, we can work together to invent the future for the good of all. It's an exciting time. Thank you very much.

Cautionary Note Regarding Forward-Looking Statements:

Certain information contained herein is forward-looking information based on current expectations and plans that involve risks and uncertainties. Forward-looking information includes, among other things, statements concerning the economy, job creation, cost and schedule for completion of ongoing construction projects, benefits of ongoing construction projects and current and proposed environmental regulations and related compliance plans and estimated expenditures. Southern Company cautions that there are certain factors that can cause actual results to differ materially from the forward-looking information that has been provided. The reader is cautioned not to put undue reliance on this forward-looking information, which is not a guarantee of future performance and is subject to a number of uncertainties and other factors, many of which are outside the control of Southern Company; accordingly, there can be no assurance that such suggested results will be realized. The following factors, in addition to those discussed in Southern Company's Annual Report on Form 10-K for the year ended December 31, 2013, and subsequent securities filings, could cause actual results to differ materially from management expectations as suggested by such forward-looking information: the impact of recent and future federal and state regulatory changes, including legislative and regulatory initiatives regarding deregulation and restructuring of the electric utility industry, environmental laws including regulation of water, coal combustion residuals, and emissions of sulfur, nitrogen, carbon, soot, particulate matter, hazardous air pollutants, including mercury, and other substances, and also changes in tax and other laws and regulations to which Southern Company and its subsidiaries are subject, as well as changes in application of existing laws and regulations; current and future litigation, regulatory investigations, proceedings, or inquiries, including the pending Environmental Protection Agency civil actions against certain Southern Company subsidiaries, Federal Energy Regulatory Commission matters, and Internal Revenue Service and state tax audits; the effects, extent, and timing of the entry of additional competition in the markets in which Southern Company's subsidiaries operate; variations in demand for electricity, including those relating to weather, the general economy and recovery from the recent recession, population and business growth (and declines), the effects of energy conservation measures, including from the development and deployment of alternative energy sources such as self-generation and distributed generation technologies, and any potential economic impacts resulting from federal fiscal decisions; available sources and costs of fuels; effects of inflation; ability to control costs and avoid cost overruns during the development and construction of facilities, which include the development and construction of generating facilities with designs that have not been finalized or previously constructed, including changes in labor costs and productivity factors, adverse weather conditions, shortages and inconsistent quality of equipment, materials, and labor, contractor or supplier delay, non-performance under construction or other agreements, operational performance, operational readiness, unforeseen engineering problems, and/or delays associated with start-up activities, including major equipment failure, system integration, and operations; ability to construct facilities in accordance with the requirements of permits and licenses, to satisfy any operational and environmental performance standards, including any Public Service Commission ("PSC") requirements and the requirements of tax credits and other incentives, and to integrate facilities into the Southern Company system upon completion of construction; investment performance of Southern Company's employee and retiree benefit plans and the Southern Company system's nuclear decommissioning trust funds; advances in technology; state and federal rate regulations and the impact of pending and future rate cases and negotiations, including rate actions relating to fuel and other cost recovery mechanisms; legal and regulatory approvals and actions related to the Plant Vogtle expansion, including Georgia PSC approvals and Nuclear Regulatory Commission actions; actions related to cost recovery for the integrated coal gasification combined cycle facility under construction in Kemper County, Mississippi ("Kemper IGCC"), including actions relating to proposed securitization, Mississippi PSC approval of Mississippi Power Company's proposed rate recovery plan, as ultimately amended, which currently includes the ability to complete the proposed sale of an interest in the Kemper IGCC to South Mississippi Electric Power Association, the ability to utilize bonus depreciation, which currently requires that assets be placed in service in 2014, and satisfaction of requirements to utilize investment tax credits and grants; Mississippi PSC review of the prudence of Kemper IGCC costs; the outcome of any legal or regulatory proceedings regarding the Mississippi PSC's issuance of the Certificate of Public Convenience and Necessity for the Kemper IGCC, the settlement agreement between Mississippi Power Company and the Mississippi PSC, the March 2013 rate order approving retail rate increases consistent with the terms of the settlement agreement, or the State of Mississippi legislation designed to enhance the Mississippi PSC's authority to facilitate development and construction of baseload generation in the State of Mississippi; the inherent risks involved in operating and constructing nuclear generating facilities, including environmental, health, regulatory, natural disaster, terrorism, and financial risks; the performance of projects undertaken by the non-utility businesses and the success of efforts to invest in and develop new opportunities; internal restructuring or other restructuring options that may be pursued; potential business strategies, including acquisitions or dispositions of assets or businesses, which cannot be assured to be completed or beneficial to Southern Company or its subsidiaries; the ability of counterparties of Southern Company and its subsidiaries to make payments as and when due and to perform as required; the ability to obtain new short- and long-term contracts with wholesale customers; the direct or indirect effect on the Southern Company system's business resulting from terrorist incidents and the threat of terrorist incidents, including cyber intrusion; interest rate fluctuations and financial market conditions and the results of financing efforts, including Southern Company's and its subsidiaries' credit ratings; the impacts of any potential U.S. credit rating downgrade or other sovereign financial issues, including impacts on interest rates, access to capital markets, impacts on currency exchange rates, counterparty performance, and the economy in general, as well as potential impacts on the benefits of the U.S. Department of Energy loan guarantees; the ability of Southern Company and its subsidiaries to obtain additional generating capacity at competitive prices; catastrophic events such as fires, earthquakes, explosions, floods, hurricanes, droughts, pandemic health events such as influenzas, or other similar occurrences; the direct or indirect effects on the Southern Company system's business resulting from incidents affecting the U.S. electric grid or operation of generating resources; and the effect of accounting pronouncements issued periodically by standard setting bodies. Southern Company expressly disclaims any obligation to update any forward-looking information.

Thomas A. (Tom) Fanning

Chairman, President, CEO • Southern Company

Thomas A. (Tom) Fanning is chairman, president and chief executive officer of Southern Company, one of America's largest producers of electricity. Elected by the board of directors in July 2010, Fanning became president of Southern Company in August 2010 and assumed the additional responsibilities of CEO and chairman in December 2010.



functions. In this role, he served as the chief risk officer and had responsibility for corporate strategy. Prior to assuming the role of chief financial officer, Fanning was president and CEO of Gulf Power.

While at Gulf Power, Fanning was active in the state arena. He worked closely with Florida Governor Jeb Bush to develop state government policy,

served on the Governor's Transition Policy Team and in 2003 was appointed by Governor Bush to co-chair the Base Realignment and Closure (BRAC) Advisory Committee.

Fanning has worked for Southern Company for more than 30 years and has held 15 different positions in eight different business units, including numerous officer positions with a variety of Southern Company subsidiaries in the areas of finance, strategy, international business development and technology.

Fanning serves on the board of directors of the Federal Reserve Bank of Atlanta, the Georgia Tech College of Management advisory board, the board of trustees for the Georgia Tech Foundation, the Institute of Nuclear Power Operations board of directors, and the World Association of Nuclear Operators - Atlanta Centre governing board. He also is vice chairman of the Edison Electric Institute and a member of the Business Roundtable.

Most recently, Fanning served as chief operating officer, where he was responsible for Southern Company's generation and transmission, engineering and construction services, research and environmental affairs, system planning and competitive generation business units. Fanning also was responsible for leading Southern Company's efforts on business strategy and served as a director of Southern Nuclear, Southern Company's nuclear plant operating company.

Fanning earned bachelor's and master's degrees in industrial management, and was also awarded an honorary doctor of philosophy degree, from Georgia Tech. His executive education includes programs at the International Institute for Management Development in Lausanne, Switzerland, the Harvard University School of Business and the University of Virginia's Darden School of Business.

Fanning previously was the company's chief financial officer, where he was responsible for accounting, finance, tax, investor relations, treasury and risk management



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