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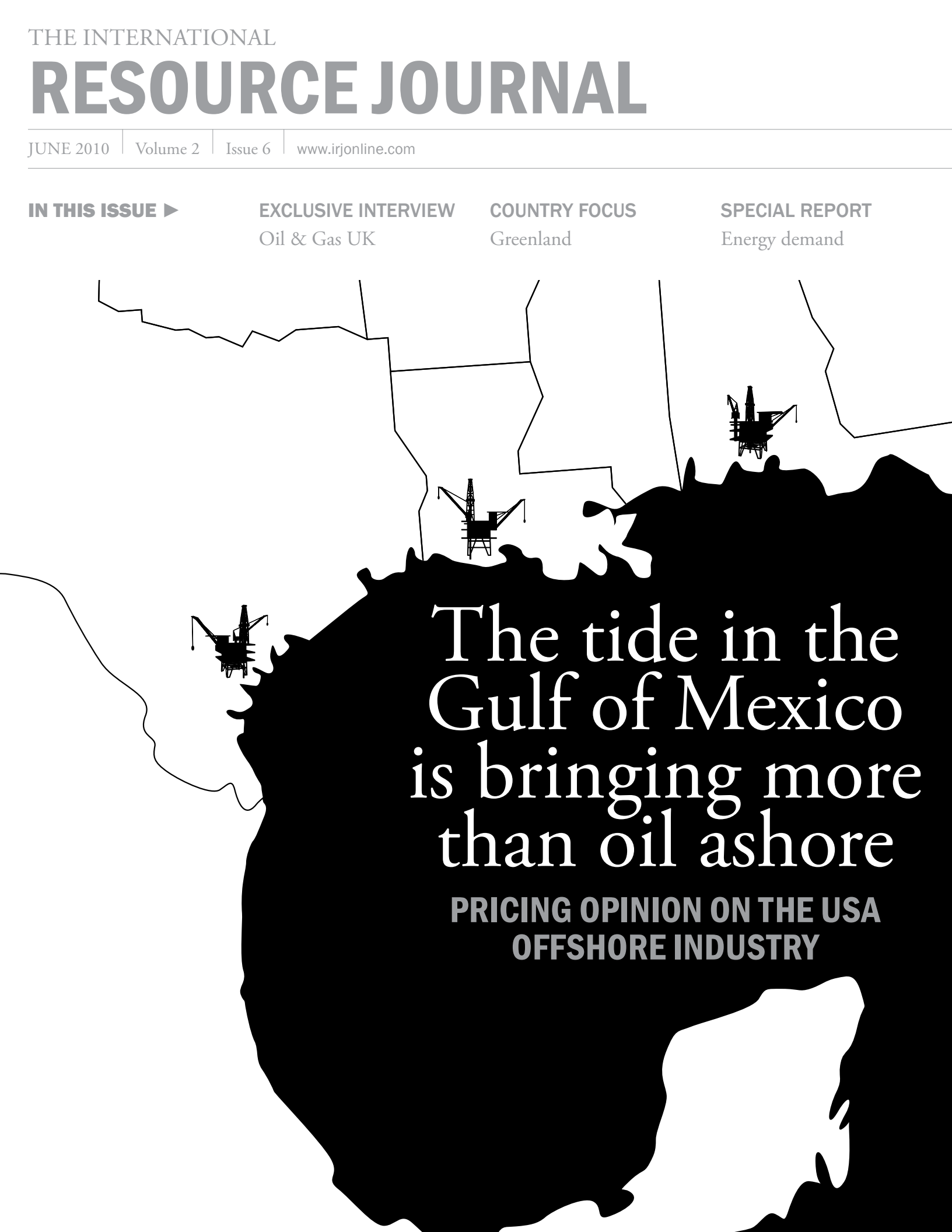
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**AVOIDING
GRIDLOCK**

ADVANCED METERING INFRASTRUCTURE HERALDS DAWN OF THE SMART GRID

by Jane Allen,
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SOMETIMES A NEW way of doing things is little more than that—new. In other words, sometimes new is not improved. But sometimes it is. Take, for instance, advanced metering infrastructure (AMI). AMI is a suite of technological solutions used to enhance measurement and control of electricity through the distribution system. But, more than that, AMI is a step change toward what will be an entirely new (and improved) mechanism for managing electricity use around the world—namely, the “smart” grid.

While widespread North American adoption of AMI has begun, lessons from implementations in Europe and Australia (where legislated AMI adoption has been largely successful) demonstrate that the technology is only part of the equation and that utilities must consider the longer-term implications. As we see it, AMI is an opportunity for utilities to transform their distribution infrastructure into the next generation of smart grid technology and innovation. Moreover, when combined with expertise in strategic program management, human capital and consumer marketing, a successful transformation will lead increasingly to business models focused on clean technology, work environments where innovation prospers and greater orientation toward customer service.

Time to smarten up

The latter half of the 1990s (1996-2000) saw 41 per cent more outages in North America affecting 50,000 or more consumers than the first half (1990-1995). The blackout of 2003 alone affected 10 million people in Ontario and 45 million people in eight U.S. states, resulting in eight deaths and a \$6 billion economic loss to the region. But such cases (as broadly impactful as they can be) are not the only drivers of the shift toward AMI.

More generally, the energy utility industry is under the following pressures:

- Heightened regulatory demands—Provincial/state and national governments and regulatory bodies are legislating utilities to begin the AMI adoption process.
- Evolving energy supply/demand dynamics
 - Electricity needs have exceeded capacity growth over the past decade.
- Weakening and/or aging infrastructure
 - The technology underlying the grid has changed little in the past hundred years, blackouts and brownouts are increasing in frequency, and the grid’s highly centralized nature leaves it vulnerable to widespread failure.
- Incompatible infrastructure—The current grid lacks enabling technologies

to effectively assimilate increasingly demanded (and available) alternative and renewable energy sources.

It is under precisely these circumstances that AMI adoption will be transformational, allowing utilities to usher in a new era of energy efficiency, improved economics and customer satisfaction. To put this in perspective: the energy savings of a 5 per cent efficiency improvement to the North American electricity grid would equate to permanently eliminating the fuel usage and GHG emissions of 53 million cars.

At its physical core, AMI consists of meters that monitor and communicate power flows, controls that measure and monitor flows, and data management systems that store and process metering and control data. A true smart grid, however, will be an automated, widely distributed energy delivery network characterized by a two-way flow of electricity and information that will monitor everything from power plant activity to customer preferences at the level of individual appliances. In that sense, the smart grid is the ultimate sector-wide destination, with AMI merely the first major step along the road.

For individual companies, the destination is well-characterized in terms of the outcomes noted above: sustainable business models focused on clean technology, work environments

where innovation prospers and greater orientation toward customer service. These are the desirable, post-AMI future-state conditions that earnest investment in the transformation will yield. For more perspective, note that the North American AMI market is anticipated to reach a value of \$4.7 billion by 2013. Virtually every utility in North America is considering AMI. But the extent to which individual utilities recognize that the opportunity is about becoming transformative leaders in their industry remains inchoate.

All aboard

The potential benefits of AMI adoption accrue to multiple stakeholders, including energy providers (utilities), energy regulators (governments and regulatory bodies) and energy consumers (residential, business and industrial).

Both utilities and governments benefit from AMI as a foundation for future innovation. These two stakeholders also share an interest in the wiser use of energy: AMI is expected to reduce the need for fossil fuel through reduced energy use and increased use of renewable energy. Furthermore, with fully-electric cars on the horizon, the electricity system will have to get smarter to cope with increasing demand in the form of automotive recharging.

All stakeholders can expect to benefit from

greater grid reliability, beginning with a reduction of blackouts and brownouts. Recurring cost savings would accrue to consumers, as tracking capabilities associated with AMI help consumers cut back on their energy bills and, to utilities, through more effective deployment of staff.

Governments would welcome the increase in “green jobs” and in renewable energy feeding the grid. Indeed, the Canadian province of Ontario has already implemented time-of-use electricity pricing and is working on installing smart meters in all homes and small businesses. Meanwhile, British Columbia has mandated province-wide deployment of smart meters by 2012. Most recently in the U.S., the Obama administration has earmarked \$49 billion for upgrades to the U.S. grid.

Consumers, finally, would welcome an increase in renewable power, especially given the potential to sell energy from residentially-installed solar panels back to the grid, an ever-increasing possibility as the smart grid comes to full maturity. An AMI-powered grid could also support so-called “demand response” products—appliances that turn on or off depending on the price of electricity at any point in the day.

More action than reaction

To truly harness the transformational benefits of AMI, it is critical that North American utilities take



a long-term, integrated approach to adoption. Focusing on the post-AMI state of the utility will foster the development of detailed implementation plans that incorporate the necessary activities to best undergo the process. More importantly, the forward-looking approach will shift utilities away from considering only the technology required to support an AMI implementation to focusing on the holistic suite of services required to achieve true transformation.

There are risks, of course. Achieving sustainable, clean-energy-focused business models could meet resistance within organizations that have limited understanding of how to implement AMI. These organizations might also be unfamiliar with the long-term regulatory requirements associated with clean technology. In some cases, their own personnel simply might not see AMI as a transformational opportunity.

More innovative work environments can be hampered by a limited ability to predict and plan for long-term talent requirements; by ineffective processes and infrastructure to support talent attraction, development and retention; and limited support for innovation and risk generally.



Finally, customer service enhancements can be stymied by insufficient customer service tools to support increasingly resource-savvy consumers and by simply failing to take advantage of customer service as a differentiator in the marketplace or to meet regulatory expectations.

Happily, mitigation strategies for dealing with these risks can be put in place. Threats to the sustainable business model can be addressed with executive team visioning sessions that seek both to reach consensus on the model and to outline tactics for achieving it, as well as by establishing a Program Management Office and a comprehensive change plan to manage execution.

The more innovative work environment can be sustained by identifying Critical Workforce Segments that will drive the greatest value for the organization over time and by better aligning talent strategies and programs with the utility's long-term business priorities.

And risks to heightened customer service orientation can be headed off with the following two strategies: (1) a long-term integrated marketing strategy focused on aligning the utility's brand with the smart grid's transformational benefits,

and (2) a sophisticated customer service department that provides more engaged consumers with real-time information and service.

Through the green—and clean—looking glass

Utilities are under pressure from both power- and eco-conscious consumers and from governments, all of whom are demanding cleaner products and services that use resources efficiently, reduce costs and embrace quality. Utilities that recognize this have the opportunity to use AMI as a means to accelerate their competitive position in this new, “clean” environment.

Moreover, if managed properly, this opportunity will propel lagging North American utilities to the forefront of smart-metering technology worldwide. The critical next step for organizations is to coordinate with government and regulators to develop effective standards that will support an integrated movement toward the smart grid. Turning the lights on now and investing in AMI will drive the infrastructure development needed to power a green economy. **IRJ**

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