

A New Path Forward: Manufacturing

Innovation and Its Role in Renewing Michigan

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We are living in remarkable times. The state of the economy has rarely been so “top of mind” for so many people from every walk of life.

How often have you been in a conversation with a friend ...or maybe in a meeting for work – and someone shakes their head and says: these are crazy times?

I thought about that as I was putting together today’s remarks. It reminded of a quote by one of the great thinkers of the 20th Century – Albert Einstein.

Einstein said, “The definition of insanity is doing the same thing over and over again and expecting different results.”

That bears repeating: “The definition of insanity is doing the same thing over and over again and expecting different results.”

You see, I propose that unless we forge a new path forward – one that embraces innovation as a means to turn challenges into opportunities – then five, 10, even 15 years from now, we can only expect to see results that are much the same as today’s.

The nation as a whole is at a critical juncture in its history. The world as we know it has been reset. If the worst financial downturn since the Great Depression has not demonstrated that, then the global trends in demographics, technology, emerging markets and the environment that promise to reshape our future certainly are.

Some may call me an optimist – or worse! – but let’s remember – it’s just “another” critical juncture in a long journey. We have met and overcome challenges throughout our history as a nation and as a state. That’s what we do. Now we need to think smart and think fresh.

I think Michigan is a good place to be in such times. Why? Because the challenges we face will require and inspire new ways of thinking, which will lead to new and better results. It is truly an opportunity for each one of us in this room.

I’ve lived most of my adult life in Michigan – attending college here and working more than 30 years for one of the most dynamic and growing 111-year-old companies in the world. I’ve watched first hand as Michigan suffered through high inflation, high interest rates, several recessions, and the decline of the big three.

In fact, in the early 80’s, when I was still a fairly new hire at Dow, I had my salary frozen due to the unprecedented financial issues of the day. I was forced to take vacation that I did not have to keep the company healthy. I remember these and other tough times we have experienced, and I am sure many of you have your own stories of tough and challenging times. What can we learn

from these experiences? How do we reshape Michigan to build a better, more secure future for the next generation in Michigan?

We all know the challenges facing our state today...and they *are* daunting:

- An unprecedented eight consecutive years of job losses.
- Near the bottom of the national rankings in both employment and per capita income.
- And the highest out-bound migration numbers in the nation.

Perhaps that's why a survey of 60 of Michigan's most prominent CEOs showed that 68% of them believe that Michigan's economy will worsen over the next six months ... while only 20% of them thought that the U.S. economy as a whole would worsen.

But it's not all doom and gloom.

In fact, if any lesson should be taken away from this recent economic unraveling, it should be this: Our nation's future economic strength does not rest with Wall Street. It rests with Main Street. And given all the Main Streets in all the cities in Michigan, we should be well positioned to win this next round.

We've learned – the hard way – that bubble-and-bust cycles, built on reckless speculation, can provide the illusion of prosperity, but not lasting fortune.

As Dow's chairman and CEO Andrew Liveris said at the Detroit Economic Club in June of this year: “We became enamored with making money from money...”

Some believe that industries like finance and the service sector will replace manufacturing in the future. But an analysis by MIT refutes that. They state that there are only four economic sectors that generate material wealth: agriculture, mining, manufacturing, and construction. Other sectors, such as services and trade, redistribute this wealth, and are built on the products created by the wealth generators. Of those four wealth-creating sectors, manufacturing plays a unique role because, unlike agriculture and mining, it is not directly limited by natural resources. And, unlike construction, most manufacturing products are easily transferable across national and international borders. This means that manufacturing is and will continue to be the fundamental base for the economic health and security of the United States. This comes from congressional testimony that was presented back in June 2003.

As a nation, we must get back to using our ingenuity to *make* things – *real, tangible, innovative* things that can improve people's lives and rebuild our economy.

That's where Michigan can play a role. Our state is well-positioned to become a model of 21st Century innovation.

One reason is simply necessity: our state's economy, long based on the fortunes of the auto industry, is in the grips of profound structural change. It is not a question of *whether* we adapt. It is a question of *how* we adapt – and *how soon*.

Another reason: Michigan is a state that knows *how to make things*. The life force and strength of this country was built by American industry. That's what drove technology and employment in the 20th Century, and built great industrial cities such as Detroit.

And yet a third reason – perhaps more personal. Many of us are parents in this room. I myself have four daughters, two of college age (in fact, one here at MSU and another over at U of M). It is my hope that these two daughters -- along with their sisters to follow – at least have the CHOICE about accepting a job and raising families in Michigan.

Good jobs can return to Michigan, *if* we can unleash the creativity and innovation that once made this state the envy of the world. That creativity and innovation still resides here – it's part of our DNA.

Change can come, but it will require a new way of thinking. The “same old, same old” is not working anymore. It hasn't for a while. To continue to do things the same way we always have, and expect a different outcome, is, well... the definition of insanity. If nothing changes – then nothing changes.

Change will require that we chart a clear and actionable path forward on four key – and interconnected – building blocks: **Technology ... Energy ... Environment ... and Manufacturing**. And it will require leaders throughout our state – in government, at universities, and in businesses like yours and mine – to join forces and take command of events.

Dow is committed to join in this effort to create the next wave of economic progress in Michigan. Our global headquarters are in Midland, and 6,000 of our more than 50,000 employees call Michigan home. For 111 years, our company has been built around our founder's philosophy to “do it better.” It is a philosophy that has helped us remain competitive and adjust with the times. At first, Dow sold only two products out of one plant in the middle of nowhere, Michigan. Today we run production facilities in 37 countries that make and sell more than 3200 products to customers in 175 countries.

We also have learned a little about adversity through the years – and we understand that creating a strong future requires delivering in the face of challenges. And, wow, was this past year challenging!

As most of you are probably aware, Dow was hit with what we describe as a perfect storm within a perfect storm: At the same time that global demand bottomed out ... and the credit markets dried up ... a joint venture partner pulled out of a \$17 billion project at the eleventh hour. This left us without the primary source of funding to conclude our \$18 billion deal to buy the Rohm and Haas Company.

It was a very difficult time that required difficult choices. We had to downsize significantly, cut back spending dramatically, and retrench in every way. Yet, one thing we never did was waver from our long-term strategy to transform into an earnings-growth company based on valuable, high-growth businesses with a leadership position.

Years ago, we came to the conclusion that to do things the same way over and over again would be insanity for a company serving global markets that are changing rapidly.

Our transformational strategy is helping us write the next chapter in Dow's history, and it helped guide us at the beginning of this year as we focused on the basics of running the business, preserving our financial flexibility and integrating Rohm and Haas.

Now, six months later, it's not all clear sailing – the economy still presents real challenges and we are working to pay down the debt we took on. But we are a stronger and more agile company today. We're shedding unprofitable businesses that are based on old commoditized technology. We're focusing our attention on true market-driven technologies that position Dow to address global trends and growth markets.

Transformation has been our watchword in Dow this past year – and we are really living it.

Similarly, Michigan is writing its next chapter. And transformation needs to be its watchword. To make it a success story, Michigan must outline a transformational strategy that pays attention to market trends and forces, and allows our communities and businesses to invest in their people and infrastructure accordingly. As I mentioned, a dramatic industrial renewal should be based on four, interrelated building blocks: **Technology ... Energy ... Environment ... and Manufacturing.**

First, technology. The only way to sustain a real competitive advantage is to invest in the needs of tomorrow. This investment is vital in bringing new ideas to the marketplace, which is the essence of innovation.

Dow has never forgotten the importance of Research & Development. In fact, each year, we spend much more than \$1 billion on R&D.

Historically, Michigan ranked near the top of the 50 states in industrial research. Motor vehicle manufacturing dominated industrial R&D spending in Michigan – fueled by the Big Three automakers' investment here, and the presence of more than 330 motor vehicle-related R&D facilities. The state ranks among the top 10 in academic R&D spending, too.

But there's room for improvement. For example, from 2001 to 2006, Michigan was near the bottom – 42nd – among states that gained high-tech jobs. In fact, the state shed nearly 26,000 high-tech jobs during that time.

It's sobering that the same CEO survey I cited earlier showed that 90% of the respondents believed that over the next six months employment levels in Michigan would remain the same or worsen.

Now, consider that in a flattening world, the places with the greatest concentrations of talent win. States and regions without concentrations of talent will have great difficulty retaining or attracting knowledge-based enterprises.

That is why, if we are going to get serious about innovation in this state, we must do a better job training the next generation of innovators. It's no secret that America is increasingly falling behind in that competition. Our high schools fall short of the mark in science and math. This helps explain why only 4 percent of American college students have chosen engineering as a profession.

A recent study by the National Center for Education Statistics compared 15-year-old U.S. students with students in other nations. It found that U.S. students placed below average in math and science. In fact, in math, U.S. high schoolers were in the bottom quarter of the countries that participated.

But it's not that U.S. math scores had gotten worse during the period from 2003 to 2006. It's that while other countries improved, we stayed the same. They were playing to win. We were playing not to lose. ...that's just not good enough. ...that's not going to lift the U.S. economy, let alone Michigan's.

As a business community, we should do all we can to encourage policies that get our kids the technical education that improves their readiness to compete on a global stage.

The second building block is energy. The direct connection between energy and our economy demands that we get busy addressing the global challenge of a secure and stable energy supply.

At Dow, we believe that providing humanity with a sustainable energy supply, while also addressing environmental issues like climate change, is the single most urgent challenge that our company and society faces.

Energy is at the nexus of manufacturing and human progress. At Dow, we use energy to both run our plants and as a raw material to produce chemicals. These chemicals are used in 90 percent of the products that people touch every day – everything from iPods to toothpaste.

Because Dow is a huge consumer of energy, we also have become a great saver of energy – reducing our energy intensity by 22 percent, saving 900 trillion Btu, from 1995 to 2005. That's enough to power 8 million homes in one year. Today, we're heightening that effort through our ambitious 2015 Sustainability Goals.

While the current economic downturn has eased energy prices, we know that over the long term, global demand will exceed conventional supplies. In fact, demand will likely increase by 50 percent over the next 20 years, and 80 percent of that must be satisfied by fossil fuels, which further intensifies concerns about climate change.

We are challenged to learn to thrive in a carbon-constrained world. We believe the weight of scientific evidence makes clear that we must enact smart, market-based climate change policy. We can't run away from this challenge. We can't follow the same course of action and expect different results for our world or for our economy.

I understand the challenge is enormous, but innovation has always been our strength. ...what kind of innovators would we be if we said: "We can't do that?" We must. We can. And we will.

And furthermore, innovation that addresses climate change can translate into real benefits for Michigan. New manufacturing jobs. Economic revitalization. Reclaiming our heritage as a leading exporter of goods.

Big issues, complex stuff, I know, and you may be wondering – what does this have to do with my business? What can *I* possibly do?

Granted, the challenge ***IS*** complex, but if we collaborate for success, we can make a difference. Let's start by helping Washington understand that the energy crisis isn't just about energy. It is about job growth and manufacturing competitiveness. This means working together to advocate for a long-term Energy Security plan that:

- Promotes aggressive efficiency and conservation;
- Increases and diversifies domestic supplies of oil, gas and coal;
- And provides strong incentives to deploy alternatives and renewables – everything from solar and wind to biomass and nuclear.

By helping to solve the clean energy challenge, we can create broad economic opportunity for our state and our businesses. At Dow, we have focused on innovation in renewable energy, biofuels and battery technology. And we're excited and proud to be investing much of that technology here in Michigan – technology that is resulting in new jobs.

Let me give you a few examples:

- Investments in Dow's Michigan Operations have resulted in a state-of-the-art market development plant and R&D facility to develop and produce a solar energy collection technology called Building Integrated Photovoltaics. These BIPVs – as they're known in the industry – protect the outer surface of the building *and* generate power.
- In addition, Dow Corning Corporation, a joint venture between Dow and Corning, Incorporated, is investing several billion dollars in Hemlock, Michigan, to provide critical materials to the solar technology industry.
- And most recently, we announced that Dow Kokam, our joint venture with Townsend Kokam LLC, has been awarded a \$161 million federal grant to develop a new generation of high-power battery technology for the next generation of hybrid and electric vehicles. We will use the federal funding to construct a new 800,000-square-foot manufacturing facility in Midland, Michigan. We expect this facility to bring up to *800 new jobs* to the area.

Aligning Michigan's renewal with the challenges of energy will help put the state on the leading edge. For the question is not *whether* there will be breakthroughs in this arena – just by *whom* and *when*. Let's make it us. Let's make it sooner rather than later.

This brings us to our next economic building block, which is the environment. Integrated environmental policies that encourage sustainability aren't just good for the environment – they're good for business. At Dow, we see sustainable development as an opportunity to tap new markets that create value for our customers, consumers and the planet.

By aligning our innovation with the evolving demands and needs of society, we address the areas of greatest market need and also the areas of greatest commercial opportunity for Dow. Today we have a pipeline of more than 350 major R&D projects that are focused on global megatrends – energy...transportation and infrastructure...health and nutrition... and consumerism.

These megatrends are where we believe high demand for innovation will capture the highest margins. And our research efforts have resulted in innovations such as new drought-resistant crop technologies, reverse osmosis membranes for safer drinking water, environmentally smart coatings, and affordable solar technologies.

Investment in “Clean Tech” offers Michigan a dynamic opportunity to rebuild the state’s job base, attract new investment, and diversify the state’s economy.

“Clean Tech” or “green” jobs are not *the only* answer to evaporating automotive employment in Michigan. But the latest Michigan Green Jobs report notes that Michigan has 109,000 jobs in the private sector that would qualify as “green.” That equates to about 3 percent of private-sector employment – and leaves plenty of room for growth. What a huge opportunity for Michigan!

I believe Michigan’s manufacturing expertise can transform green technology from the alternative into the mainstream – driving costs down and making wind turbines and solar panels cost competitive.

For example, Dow’s material science expertise has resulted in a new approach to solar energy that has taken shape with the solar panels I mentioned earlier. Our building integrated photovoltaic technology involves a much more cost-effective photovoltaic material. These cells are “packaged” within the roofing product, creating a “solar shingle.” This approach enables lower fabrication and installation costs, because both the conventional and solar roofing shingles are installed at the same time.

Another example is AIRSTONE systems for wind energy. The lightweight-but-strong systems allow blade manufacturers to build larger and longer blades for higher energy output.

Finally, let’s talk about our fourth building block, manufacturing. A competitive and prosperous Michigan – and nation – includes a competitive manufacturing base.

The American consumer cannot lead our recovery. This economy must be driven by investments and exports and requires a serious commitment to manufacturing.

In case you doubt that manufacturing is a vital economic pillar of this nation, here are a few facts:

- Manufacturing employs about 14 million people who contribute about \$1.6 trillion in wealth. It equals the eighth largest economy in the world.
- It pays about 25 percent more than non-manufacturing jobs.
- And it’s responsible for more than 70 percent of private-sector R&D.

By committing, as a state, to create high-value-added jobs and having manufacturing jobs be a larger percentage of employment, we commit ourselves to improving exports and moving the needle on per capita income for a more prosperous Michigan.

And if we are going to depend on exports to help lead a sustained recovery, we will need to assure that our trade policies aren’t burdened by protectionism. Globalization is here to stay.

We must embrace it and take advantage of it. Because if we don't turn globalization into an entrepreneurial opportunity for new business and new growth, someone else will. I guarantee you others are already thinking about it.

Our choice is to be bystanders watching the world pass us by or to be at the head of the pack, leading the way.

Can anyone tell me which country has the largest level of exports? Who makes the most stuff and then sells it to others outside their borders? The answer is Germany – an export-driven economy with a highly educated workforce. What can we learn from them? What lessons can we import from their economy to rebuild our export economy?

For one, investing in the education and training of our workforce. We have tremendously talented people in our state who know manufacturing. So let's build on that foundation by developing the knowledge and skills that will enable them to drive manufacturing innovation and revitalize our state's economy.

I don't have to remind you that job creation solves so many social problems – moving people off the welfare rolls, reducing crime, building neighborhoods, strengthening the tax base – as well as boosting the economy.

So there you have it: Technology ... Energy ... Environment ... and Manufacturing – the four foundational pillars on which we will rebuild Michigan.

Rebuilding Michigan starts with a strong core of innovation. It takes a well-trained team. ... updated infrastructure ... and a commitment to work together to support an energy plan that stimulates long-term growth ...to advocate for policies that are pro-industrial yet require each of us to be responsible corporate and global citizens.

Rebuilding Michigan takes collaboration – across the public, private and civil sectors of society – and at every level of society.

In many ways, what makes a great company also can make a stronger state economy. A great company keeps its eye on problems that need solving. It invests in the future. And it recognizes that a winning strategy is part of a global strategy, in which innovation at home is aligned with the greatest needs and greatest opportunities around the world.

I am excited about our future in Michigan. By meeting our challenges head-on, we will create opportunities for:

- investing in new technology,
- making clean energy competitive,
- developing more sustainable technologies for a greener tomorrow,
- and becoming a state that leads once again in manufacturing, exports, and quality of life.

So the question becomes, how do we break the cycle of doing things the same way over and over again when we can no longer expect them to deliver desired results?

It starts with us – here in this room.

I urge you to make a personal commitment:

- to identify what one might call “corners of insanity” – those areas where we keep doing the same thing over and over again, hoping for a different result
- and once you identify them, look for new, viable solutions
- bring the people, businesses and organizations into the conversation who can help discover and implement those solutions
- talk to your elected officials – get their buy-in; get them behind the effort to encourage new ways to create sustained economic growth in Michigan
- While the private sector is the cornerstone of economic growth, there is a critical role for government action – with investments in areas such as:
 - School systems that provide students with world-class education
 - Support for basic research and innovation
 - An energy policy that encourages new solutions to mitigate climate change

This concerted effort – across sectors – will help drive the robust manufacturing innovation that creates more jobs – and better jobs – and lays the foundation for a strong and vibrant economy.

It is time to think big again in Michigan ... to renew our economy ... to innovate ...and to improve all our lives and livelihoods.

Together, we can do it. Together, we will succeed. And together, we **WILL** make Michigan the economic powerhouse that we know it can be.

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