Europe's Next Industrial Revolution

The world may be on the brink of another industrial revolution -- and Europe is leading the way. A combination of network communications and hydrogen power may usher in a whole new era of civilization.

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California Gov. Arnold Schwarzenegger tanks up the first hydrogen Hummer in California. In the future, hydrogen cars could not only power themselves, but also homes and a national power grid.

The industrial revolution is over, and the machines have won. But as jobs in factories and offices disappear, there are still opportunities to create new kinds of employment. According to Jeremy Rifkin, the first opportunity lies in what he calls the "Hydrogen Economy." The hydrogen economy envisions a transition from today's reliance on fossil fuels to hydrogen power. Individual hydrogen fuel cells would be transformed into a networked grid of energy providers that would use the same type of networks and software that run the Internet, but in the hydrogen economy, they would distribute power rather than just bits. Hydrogen cars could produce enough energy to not only to drive, but also to power a home and share energy with a neighbor. Hydrogen fuel cells, he says, could be as ubiquitous in 25 years as today's PCs.

He also argues that the steady erosion of manufacturing and service jobs could also be partially offset by a greater focus on the "third sector" -- the non-profit civil society positions that have accounted for up to 40 percent of all the new jobs created in the most advanced 15 European Union nations over the past 10 years.

In the final installment in our series of conversations with Jeremy Rifkin, the author explains how the hydrogen revolution and the "third sector" can help soften the blow of Europe's crisis of disappearing jobs.

How Europe Can Create Jobs -- By Jeremy Rifkin

The major economic shifts in history come when you have a new economic regime and a new mode of communication to organize it. Europe and the developed world are currently on the cusp of one of these shifts, which I think will be a third Industrial Revolution. If Europe succeeds in making it happen, this revolution could provide short-term jobs and buy some time in order to prepare for moving work out of the market place and into civil society. It's called the hydrogen economy.

Just look back at ancient Iraq, to Sumeria. It was the first large scale agricultural society. Organizing an agricultural energy regime was complicated and required a new kind of communications regime to coordinate it. The Sumerians created cuniform -- the first form of written communication. The printing press became the communication modality for the era of the steam engine, coal and rail. After all, you couldn't have organized the Industrial Revolution with codex or oral culture. You had to have print to keep it all managed. The telegraph and telephone became the control mechanism for the internal combustion engine and oil in the 20th century. In the 1990s, we had a great new communications revolution: decentralized mobile communications -- linking together of personal computers, via the World Wide Web, satellites and wireless technologies.

About Jeremy Rifkin

DPA

Jeremy Rifkin is the author of "The Hydrogen Economy," which has also been published in German (Campus Verlag, 2002) under the title: "Die H2 Revolution: Mit Neuer Energie für eine Gerechte Weltwirtschaft." Rifkin heads the Foundation on Economic Trends in Washington, DC, and is the author of the best-selling books "The End of Work" and "The European Dream."

What I have been suggesting to political and business leaders is that this 1990s communications revolution is the command and control mechanism for the hydrogen economy. The new hydrogen energy grid would network millions of individual energy producers -- each with their own fuel cell -- using the same types of technology used on the Internet. You have to imagine everyone having a fuel cell 20 years from now -- and every car would be a power plant on wheels. Portable fuel cells will be out in three years; you will use them on your cell phone. You will have stationary fuel cells at home and we could have as many fuel cells as we have PCs. With these fuel cells, you are your own power plant. And by linking up to a national energy grid, we will be able to create energy and exchange it with other people in the same way we now create and share information will millions of people using PCs and the Web.

Jeremy Rifkin on Europe's Uncertain Future

Part I -- Why the European Dream Is Worth Saving
Part II -- Europe's Commitment Anxiety
Part III -- American Capitalism vs. European Social Markets
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Part V -- The End of Work

For those who produce more energy than they need, that energy could then be sold back to the grid. We're going to be able to do this by taking the same exact architecture that we developed in the Silicon Valley. Using the same software and hardware, we can reconfigure every power grid in the world to make them smart and decentralized. This network would enable us to sell our surplus energy back to the grid using peer-to-peer software -- in the same way we now exchange music. We're currently testing the first software to do this in the United States.

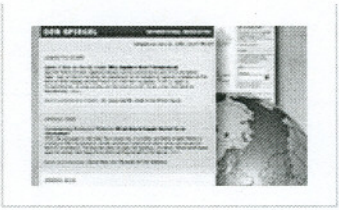
Peer-to-peer power grids

When network communications and hydrogen power come together, we will have a third industrial revolution with the potential multiplier effects we saw with the introduction of steam, coal, and trains in the 19th century, and with electricity, the telephone, oil and the internal combustion engine in the 20th century.

Right now, Europe is ahead on this. During his term as president of the European Commission, Romano Prodi pushed through a €2 billion program to invest in hydrogen research and technology. But 2 billion falls short of what is needed. There should be a mobilization across Europe -- the US can do it, too -- for a third industrial revolution that would eliminate our reliance on fossil fuels.

Producing hydrogen using renewable forms of energy and electrolysis of water would mitigate the negative aspects of the fossil fuel economy -- global warming, reliance on an unstable Middle East for oil supplies, and the debt burdens high oil prices are causing for the Third World. With prices at $60 per barrel, the Third World is going under. By switching to a hydrogen economy, you can alleviate the burdens fossil fuels create for societies and economies.

This third Industrial Revolution won't be able to absorb all the lost jobs, but the building of its infrastructure over the next 25 years would require the creation of millions of new jobs. Germany is a leader in automobile manufacturing, construction, the chemical industry, engineering,



banking and insurance. It has everything it needs to actually become the world leader in creating a hydrogen economy.

This transformation will help provide a buffer for some job losses in the short term, but in the longer term, we have a bigger problem: we need to shift vocations out of the market sector. Just think about all the high tech advances coming on in this 21st century. Do we really think we need billions of people toiling away, making goods and services when intelligent machine technologies can do the work and produce the goods and services more efficiently and cheaper?

The growth of the third sector

In addition to the opportunities created by the hydrogen economy, there is also tremendous opportunity in the third sector, non-profit organizations. Upwards of 40 percent of all the new jobs created during the past 10 years in many of the EU's 15 most advanced countries, including Germany, have been in the non-profit sector. The key to the third sector is that people are helping to build social capital -- whether it be in sports, the arts, civic society, social justice and the environment. These are all things you can't do with machines -- machines may help the sector become more efficient, but they can't replace people. The potential exists for millions of jobs in this sector.

One might ask: How do you finance these jobs? This is where people misconceptualize the nature of the third sector. They say, 'Wait a minute, it's parasitic, it relies on government grants and private philanthropy. How can this be a sector that creates new jobs?' Actually, a recent Johns Hopkins University study showed that more than 50 percent of the income in the non-profit sector in the 22 countries studied comes from fees for services.

We need to do more to stimulate this third sector: Since the 1930s we have trained generation after generation of economists to use fiscal and monetary policy to stimulate the market. Why not train the economists now to use fiscal and monetary policy to stimulate the third sector? The sector would create social capital, generate fees for services, and begin to move some employment out of a market sector that is overburdened.

There has to be a new conversation about automation. The substitution of mass human labor with increasingly sophisticated intelligent technology should be viewed as a great triumph for modern science and technology, and for humanity -- now we can actually free people from the marketplace. This won't happen right away, it will take generations. In the meantime, we have to dramatically

increase productivity, shorten the work week, push for a hydrogen economy and a Third Industrial Revolution and create new job opportunities in the civil society.

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- The End of Work (08/03/2005)