

WORLD FUTURE SOCIETY

Predictions for 2025

with my comments

Technology's Promise: Highlights from the TechCast Project

The Hydrogen Economy will seriously begin to supersede the Oil Economy by about 2020. (Absurd, we will not have the electrical power generation capacity to support even a small percentage of the vehicles.) The portability, power, and connectivity of media devices will make entertainment-on-demand a force to be reckoned with among mass-entertainment providers. (An easy prediction – it is true now!) Space tourism is on the verge of "a golden age," as short, suborbital flights become more affordable--and whet the public's appetite for longer adventures. (Only for people with incomes above \$500,000. The rest of us will have to wait until 2050 or beyond.) The ongoing TechCast Project pools the insights of 100 high-tech executives, scientists, engineers, academics, consultants, futurists, and other leading experts around the world to outline how the technology revolution is poised to transform life over the next 20 to 30 years

Forecast #1

The Race for Genetic Enhancements Will Be What the Space Race Was in the 20th Century— Genetic therapies and biomedical enhancements will be a multibillion-dollar industry. New techniques will enable doctors to change your DNA to revitalize old or diseased organs, enhance your appearance, increase your athletic ability, or boost your intelligence.

The race may occur but the anticipation of results is overly optimistic. There will be several achievements along with major disasters.

Forecast #2

Water Becomes the New Oil—Water desalination may soon become one of the world's largest industries. By 2040, at least 3.5 billion people will run short of water—almost 10 times as many as in 1995. The huge demand, plus new more efficient desalination technologies, will create enormous profit opportunities and bring new life to arid regions.

The need exists. Products will appear. The real question is the power required. Major expansion in power generation is required.

Forecast #3

WiMAX Networks Will Soon Create Country-Wide Wireless Internet Access—Often described as "Wi-Fi on steroids," WiMAX (Worldwide Interoperability for Microwave Access) will cover entire countries with a vibrant, high-speed wireless communications network. Internet access and other data and video applications will be available anywhere with many applications for automobiles.

WiMax is probably only a transitional technology. World wide satellite connectivity will probably be available before 2025.

Forecast #4

By 2025, the Worldwide Average Life-Span Will Be Extended by One year Per Year—Only 15% of deaths worldwide will be due to naturally occurring infectious diseases.

Overly optimistic. Bacterial and viral evolution will probably create diseases never imagined before.

Forecast #5

Bioviolence Becomes a Greater Threat—In the next decade, biological technologies that were once at the frontiers of science will become available to anyone with minimal scientific training. Emerging biotechnologies, such as genomics and nanotechnology, will allow bacteria and viruses to be altered to increase their lethality or make them more resistant to antibiotics.

Obviously true. Differentiating between natural and bioviolence diseases is unproductive – either will kill you.

Forecast #6

Invention Becomes Automated—Tomorrow's inventors won't toil away in workshops painstakingly building, testing and refining their creations. Instead, the Edisons of the next decade will spend their days writing descriptions of the problems they want to solve, and then hand those descriptions to computers to work out the solutions.

This technology has already designed a successful antenna for a NASA space mission and invented innovative consumer products. It promises to spark a revolution in innovation and allow non-technical people to become inventors.

Conceptually not different from Edison having technicians build his models. Many tools exist to assist in the design and analysis of new devices. Expecting major inventions from non-technical people is like expecting great literature from Twitter.

Forecast #7

Japan Dominates the Race for Personal Robots—Despite the popularity of the Roomba floor sweeper, the U.S. lags behind Japan in the development of robots for the home. The Japanese are hoping to have a robot in every home by 2015. Korea is following suit and has mandated a robot in every home by 2020.

Most home robots are toys. A useful home robot will require intelligence behavior well beyond anticipate development.

Forecast #8

Holographic 3-D TV—Tomorrow's 3-D televisions won't require special glasses or even screens. Mathematicians in Finland have produced a blueprint for instruments that would project floating 3-D images by means of nanomaterials that bend light around objects.

Simulation of a 3-D image just beyond the surface of the screen would be an interesting minor development. A true walk-through, interactive 3-D display would be a major innovation. Probably long beyond 2025.

Forecast #9

The ‘Holy Grail’ of Computers Becomes a Reality—The advent of human-level artificial intelligence—a machine capable of the richness of expression and nuance of thought that we associate with humanity.

Computers with artificial intelligence (AI) will be able to learn and think. They’ll be able to handle complex tasks such as navigating a car through traffic or diagnosing a complex illness.

Not as long as AI continues to rely on the von Neumann model for computation. Massive, parallel neural nets with shared associative databases might show promise. This appears to be how the brain works.

Forecast #10

Electric Cars Become Fully Practical by 2020—Discover how companies in Denmark are making wind-powered charging stations for electric cars. Freshly charged batteries are exchanged for drained batteries in less time than it takes to fill a car with gas. Consumers pay for the service on monthly plans like mobile phone service.

Analysts at Deutsche Bank are enthusiastic and believe this concept could eventually transform the auto industry and neutralize petrodollar power within the next decade.

Major – read massive – power generation will be necessary to support electric cars. Estimates for the US is that one nuclear power plant – or equivalent – would have to be constructed ever week through 2030 to fuel vehicles.

Exchangeable batteries are essential for practical electrical vehicle.

Forecast #11

Religion Growing in China while Secularism Grows in the Middle East—The skyrocketing economy and tumultuous changes are leading to a yearning among the Chinese for the stabilizing influences of religion. Meanwhile, surveys indicate that the Middle East may be starting to move away from fundamentalism, especially in politics.

Obvious truism. China starts with a low religious base – it can only increase. The fundamentalistic Middle East can only become more secular.

Forecast #12

New Oil from Old Wells—An innovative energy company has developed a unique microwave technology to extract oil from abandoned oil wells.

The company says it can gain an extra 100 barrels per day and is in negotiations with one of the biggest oil services firms in the world to bring 10,000 of these wells back into production.

Extracting oil from depleted fields practical but expensive. Several technologies are possible but expensive. If the sustained price of oil exceeds \$200/barrel, expect major investment.

Forecast #13

Green Gold: Algae’s Huge Potential as Biofuel—Biofuels made from algae could soon provide a substantial portion of our transportation fuel needs. That’s because algae have much higher productivity

potential than crop-based biofuels. Algae is capable of producing 5,000 gallons of fuel per acre, which could meet perhaps 30%-60% of U.S. oil needs, a chief NASA scientist told a recent World Future Society meeting. Biomass could generate millions of gallons of additional liquid fuel annually by 2020. The cost of algae oil, once commercialized, has been forecast as low as \$20 a barrel.

Definite possibilities. However the cost analyses do not include disposal of waste products or the chemical or biological contamination of alga beds. More problems to be solved which will undoubtedly increase the cost.

Forecast #14

Nanotechnology May Alter the Value of Diamonds and Other Precious Commodities—

Nanotechnology, the creation and manipulation of matter at the nanoscale (one billionth of a meter) is likely to make many finely made goods much less expensive. Breakthrough processes are creating laboratory-grown diamonds that are molecularly identical to natural diamonds, yet a fraction of the cost. As large inexpensive luxury diamonds become commonplace, consumers may turn to other things with more cachet.

Non-nanotech processes exist. They produce diamonds with virtually no defects. Natural diamonds always have minor defects – that is how they are distinguished from synthetic diamonds.

Forecast #15

The Millennial Generation Will Have Major Impacts on Society—The millennial generation, born between 1982 and 1998, will have a huge impact on every aspect of society in ways similar to their parents, the Baby Boomers. Some futurists believe Millennials are the next “great generation” of U.S. society, exhibiting many of the heroic qualities of the World War II generation of Americans.

Millennials have a strong entrepreneurial bent. Twice as many say they would prefer to own a business rather than be a top executive. Employers will need to adjust virtually all of their policies and practices to the values of this new generation, including finding new ways to motivate and reward them.

Making predictions on the desires of 11 to 28 year-olds is chancy at best. Every generation has had its unique contributions. The circumstances that they experience will have a major impact on their “greatness.”

Forecast #16

Quantum Computers Revolutionize Information Around 2021—A new revolution in computing may make computers exponentially faster than today.

It's based on the strange behavior of matter at the quantum level. The basic unit of a quantum computer is a “qubit”—an electron spinning either clockwise or counter clockwise, representing a 0 or a 1. Because electrons can coexist in two places simultaneously, a single electron can carry two qubits, two electrons can produce four qubits, three electrons, eight, and 20 electrons could perform a million computations. The exponential growth raises the hope of infinite processing power.

A quantum computer could easily complete in seconds a task that would take a silicon computer billions of years. The first research prototypes are now running at Harvard University, the National Security Agency, and the Federal Reserve. These revolutionary computers may be on the market in about ten years.

If they can be perfected, quantum computers will work extremely well for a limited class of problems. Breaking encryption is one major application. For 99.9999% of computer applications, a quantum would be absurd – for example word processing.

Forecast #17

Breakthrough DOUBLES Solar Energy Output—An exciting advance in photovoltaics could DOUBLE the performance of existing solar panels and go a long way toward making solar electricity more competitive with conventional grid energy.

One company believes it will have practical and affordable solar energy on the market in three years.

It's about time! This prediction has been made continually for the past 40 years.

Forecast #18

Consumers Will Take Active Roles in Inventing New Products and Services—Today's consumers are increasingly demonstrating their desire and willingness to modify the products that they buy. They are no longer passive consumers, but becoming active “prosumers” (producer-consumers).

Forward-looking companies have begun to embrace prosumers as sources of innovation that can be incorporated into new products.

A very small number of “hobbyists” consumers have always modified their purchases. Unlikely that the typical consumer will – or can – modify many products.

Forecast #19

Virtual Education to Enter the Mainstream by 2015

Only 10% of college education is now conducted online. But E-training accounts for 30% of corporate training, and will likely exceed 50% soon. The fact that 100 million Americans are taking continuing education suggests a healthy and growing market for online college courses.

I was almost fired for suggesting this for a Government contract in 1980. Are the “experts” finally catching up?

Forecast #20

Genetic Research May Soon Conquer Most Inherited Diseases—Exciting research points the way to finding cures for diseases such hemophilia, cystic fibrosis, a number of cancers, and AIDS.

Eventually, some 4,000 hereditary disorders may be prevented or cured through genetic intervention.

One California firm has even developed techniques that allow it to rewrite the patient's own DNA, rather than replacing it, to correct hereditary errors.

Overly optimistic. There will be substantial treatments and some disasters.