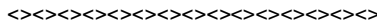


Solutions to our problems are available, but they are not simple and they will take time to construct. People like simple solutions. Sometimes the solutions that look simple create more problems than they solve. Careful consideration is a requirement.



NORTHWEST GRID FEELS THE HEAT — Last summer’s heat storm could prove a harbinger of more energy crises, by Michael Milstein — *The Oregonian*, May 20, 2007

Searing heat last summer threatened the Northwest’s power supply, just as California drew more electricity than ever. As the temperature soared past 110 degrees, a Bonneville Power Administration converter in The Dalles was in danger of shutting down, cutting power to Southern California. As climate change brings milder winters and warmer summers to the Northwest, the region’s peak energy usage has switched seasons...

Monday, July 24, the summer of 2006: Temperatures shot toward the upper 90s, far higher than expected. The West Coast burned red on weather maps. Air conditioners strained, gulping electricity like Gatorade. With each degree, demand accelerated... Above the trading desks a screen glowed with more trouble: A Montana coal-fired power plant that supplies PGE sputtered and shut down. In California, broiling transformers exploded like Fourth of July rockets. Power managers there teetering close to blackouts declared an emergency, seeking precious power from the Northwest’s hydroelectric dams. Energy prices spiked nearly fivefold, hitting a federal price cap of \$400 per megawatt hour. Some sellers milked the frantic market, demanding \$600... Then, suddenly, nobody had power to sell at any price. For the first time in company history, PGE declared an electrical emergency as it came closer than ever to running out of power to keep lights on.

Two competing forces have put us on course for the same thing to happen again: Rising summer temperatures, on one hand, and growing legions of energy-hungry air conditioners on the other... Our demand for electricity historically peaked in the winter. Now it is rising fastest in summer, when it’s in shortest supply. Northwest utilities are aggressively seeking new sources of summer electricity and promoting more conservation. Without that, the Northwest will run short of summer electricity within 10 years — and possibly as few as three, says John Fazio, systems analyst with the Northwest Power and Conservation Council...

Going into that scorching weekend last summer, forecasts predicted the heat wave would let up by Monday. So PGE traders, finishing work on Friday, lined up what should have been plenty of electricity to keep air conditioners humming for their 1.5 million consumers... Nighttime temperatures at the Portland airport Saturday hovered near 74 degrees. Never since record-keeping began had it stayed so warm through the night. Eugene, Medford and Salem all set similar records... Sunday it hit 101 degrees in Portland and 105 degrees in Salem. The heat wave was hanging on. Monday morning at 6:30, Jim Lobdell, PGE’s vice president for power operations, held a conference call with his staff. Lights and air conditioning would soon switch on in offices that had baked like ovens through the weekend. Temperatures were heading toward 97 degrees, 7 degrees higher than forecast. “It effectively told us we needed a whole other power plant out there that we weren’t anticipating,” Lobdell says. “And so did everyone else... Utilities across the Northwest scrambled to make up the shortage. “You’d call someone, and they would say, ‘I’m glad you called — you got anything to sell?’, says David Mills, director of power supply operations at Puget Sound Energy. “You’d say, ‘Well, no — we called to buy from you.’ “

A decade or two ago, summer nights turned cooler than they do now. Even if they didn’t, fewer air conditioners drained energy from the system. The Northwest never really needed air conditioning; nights brought reliable, cool relief... That set up an elegant West Coast electrical balance. In summer, the Northwest sent extra electricity south to run California’s air conditioners. The sales brought in money that helped offset power rates here... In winter, when Oregonians crank up their furnaces and space heaters, Northwest power demand peaked. That’s when California has energy to share... But now the Northwest’s peak power needs are upsetting the balance that worked so well. In 2002, PGE’s annual power demand peaked during summer for the first time. The peak came in summer again in 2003 and again last year. Summer peaks should be routine within 15 years, PGE says. Air conditioning drives the trend; Not 20 years ago, fewer than a third of PGE homes had air conditioning. Today, more than two-thirds do. New homes are bigger, and almost every one is built with air conditioning, and hotter summers like last year’s push more homeowners to add air conditioners.

At a control panel in the Bonneville Power Administration's (BPA) Celilo Converter Station above The Dalles, on Friday, July 21st, Larry Townsend watched a temperature gauge tick toward disaster... The Celilo station, a vast yard of wiring and transformers the size of U-Haul trucks, feeds one of the nation's largest electricity pipelines. The California-Oregon Intertie carries more than enough electricity to supply Seattle three times over. The power flows south on 1 million-volt wires across 846 miles of Oregon and Nevada desert to Sylmar, Calif., near Los Angeles... Loading that power onto the lines generates tremendous heat. Water flowing through tubes cools the machinery carrying the heat away... The water continues into a cooling building full of fans which helped dissipate the heat, but on July 21st the outside air was a fiery 113 degrees. The fans couldn't cool the water. Its temperature rose, hitting 120 degrees.

At 126 degrees, the station's multimillion-dollar converters shut down so they don't burn up. That would be like unplugging the extension cord to California, which that same afternoon was drawing more power than ever in the state's history: Streetlights would go dark. Computers would shut off. Hospitals would lose power... Others rushed to Townsend's side. The water hit 122 degrees. Everybody's watching that screen going, "What in world can we do?" recalls Dave Potter, a senior substation operator... Potter and coworker Bob Canavan raced to the cooling building. Looking around in the glare, they hit upon a plan: Hook up a fire hose, run it across the rocky yard and spray water onto vents where air enters the cooling building. They tied the hose to a green golf cart, aiming water toward the vents. In the control room, Townsend noticed the temperature had stopped rising. Then, thankfully, it began to drop.

Unusually hot summers have been five times more frequent in the Willamette Valley since 1990 than in the 100 years before, according to the Western Regional Climate Center... Summer nights especially stay warmer, which keeps buildings from venting heat. Air conditioners must turn on earlier and work harder on each subsequent day. In the past decade, nighttime summer temperatures in Portland registered about 2 degrees higher on average than 30 years ago, according to data from the Oregon Climate Service... The trend matches the way global warming works. During the day, the sun drives temperature by heating up the planet's service. At night, temperatures depend on how quickly the lingering daytime heat dissipates. "The main thing that affects the surface temperature at night is how efficiently it is able to cool," says Alexander Gershunov, a research scientist studying the trends at San Diego's Scripps Institution of Oceanography... But rising levels of carbon dioxide, a greenhouse gas released by burning fossil fuel, trap some of the heat. That warms the atmosphere. The warmer air can then hold more moisture. The extra moisture also acts as a greenhouse gas. "It's still cooling at night," Gershunov says. "It's just not cooling as much as it used to..." At the same time, winters are warmer, holding power needs down. The Willamette Valley has not had a colder-than-average winter since 1993, the longest run of warm winters on record...

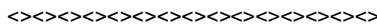
California power officials, and some in the Northwest, say what happened last summer was an unusual weather coincidence unlikely to occur more than once every 80 years. But Danial Cayan, director of the Scripps Climate Research Division, warned the California Energy Commission that what is now unusual may become less so. If you believe climate models, he says, in 20 years heat waves will be two to three times more common than now.

Until last July, California's coast cities had never stayed so hot for so long. Nighttime temperatures set records. California's power masters were a push-button away from blocking people out. They asked the BPA for more Northwest Hydropower... Steve Oliver, the BPA's vice president for power supply, had already told the Californians to look for other power. Buy whatever you can, he told them, wherever you can... The wind turbines that have sprouted across the West were little help. The high-pressure system making the region a sauna brought wind to a halt... The BPA prepared days ahead of time by moving extra water behind Columbia River dams so they could churn out more hydroelectric power, but the dams operate under federal court orders because of the harm they pose to salmon, limiting the power the dams supply. Judges ordered extra water spilled to help salmon get downstream. Dam operators can shift water to the turbines, generating extra power, only if energy gets scarce enough to put human life at risk... The morning of Monday, July 24, Oliver got on the phone with a team of biologists. It may be time, he said, to make that call... But California was not the only place anxious for power. Northwest utilities were in trouble, too. PGE activated backup generators at hospitals and other sites to reduce the strain on its system, but customers drew more and more... It wasn't merely a matter of not enough power. It was also a matter of getting it to the right place... The web of electric cables that crisscrosses the Northwest behaves much like water pipelines. Only so much electricity can flow through it... Heat makes the lines sag — sometimes 10 feet or more. Power flowing through them does the same; so, if they're already sagging from the heat, they cannot carry as much power — or they might drop too close to the

ground... That meant the lines last July carried less electricity at the very time it was needed the most. Just about every main line was at capacity. Or, as Robin Furrer, the BPA vice president for transmission puts it, "the pipes were full."... The BPA had clearance to release extra water from Grand Coulee Dam, generating extra electricity when demand peaked, but bottlenecks formed in the transmission lines stretching across eastern Washington... Energy handlers at the BPA's Dittmer Control Center in Vancouver oversee 15,000 miles of lines... But they could not find a route through the overloaded lines to move power to California... In Portland, neighborhoods broiling transformers died, cutting off power. Demand overloads transformers more easily when it's hot because they cannot get rid of their internal heat fast enough, and new air conditioners make them work hardest when it's hot... In the end, electricity customers saved themselves from blackouts on that searing day. In California, Gov. Arnold Schwarzenegger appealed to residents to save energy, and they did — cutting their usage by several power plants' worth. In Portland some factories shut down and let PGE buy back the power they would have used... The BPA, among the few to see the heat coming, doled out enough power for the West Coast to keep its lights on, without putting salmon at risk... Utilities know that global warming is also likely to reduce summer water supplies that let dams generate power, even as the demand for that power keeps rising... But last summer, at least, the heat finally let up. And that time, at least, the relief came just in time.

Energy Hot Rocks, By David Biello — *Scientific American*, April 2007

Geothermal power plants could supply the energy needs of the U.S. thousands of times over, concludes an 18-member panel led by the Massachusetts Institute of Technology. Geothermal stations create electricity by relying on liquid or vapor heated deep within the earth. The panel proposes to construct many new geothermal power plants, drilling down in the high-temperature bedrock, creating an open reservoir and pumping liquid into it to be heated. The researchers estimate that some 13 trillion (10 to the 24th) joules lurk deep underneath U.S. soil and that 1.5 percent of that energy is recoverable, without taking cost into account. More than 100 gigawatts of geothermal power (one-tenth of the current U.S. electrical generation) could be developed for \$1 billion during the next 40 years at the full cost of one carbon-capturing coal-fired power plant or one-third the cost of a new nuclear generator. The challenge: not to lubricate any faults that could trigger earthquakes as has occurred in Basel, Switzerland.



Highway projects' (average) tab goes up 24% — New figures assume higher inflation rate — ballot measure would still leave \$6 billion gap, By Mike Lindblom — *Seattle Times*, January 2, 2007

Thirteen regional projects now require \$16 billion to build as originally hoped, up from \$12.2 billion as of last January, a Seattle Times review found. So far, only \$10.2 billion is earmarked from the ballot proposal, plus existing gas taxes — leaving a \$6 Billion Gap... Cement prices spiked. Steel prices rose, largely because of competition from new skyscrapers and roads in China. A flurry of mega projects, the post-hurricane reconstruction of New Orleans, followed by floods and tornado damage this spring, triggered a labor shortage that may continue for years.

The highway plan depends on voters passing car/cab tax and sales tax increases totaling \$100 to \$120 a year for an average household... At the same time, voters will be asked for a similarly sized sales-tax increase to extend Sound Transit rail. The proposed transit tax, combined with a continuation of Sound Transit's existing taxes, would bring in \$19 billion for future construction and operations over two decades. Rob Johnson, regional policy director for the Pro-transit Transportation Choices Coalition, said the figures make the political situation more complex. State and local elected officials must unite on a final plan if they have any hope of running an effective campaign...

(Local reader John Whitmore in a Letter to the Editor in the same paper wrote...) "Adding more roads leads to higher costs... Why do you (Seattle Times) print letters that go on about light rail is too costly? Compared with what? (Freeway cars and buses?) Do those letter writers really think that laying down two tracks is more expensive than building four or six lanes of concrete? Do they think it is cheaper to resurface, fill in potholes, hire State Patrol, and investigate countless accidents, incredible amounts of injuries and death, on and on? Do people really believe that buses and cars can move more people faster, safer and cheaper than mass transit? How can a logical person come to that conclusion?")

Narration: So, if we've found nearly all the world's oil, how long before it runs out? Surprisingly, that's not so important. The real question is when will we reach halfway — it's known as "peak oil." - Jonica Newby, Reporter: *So what exactly is peak oil, and why is it so serious? That's what I'm heading to the west Australian oil fields to find out.*

Narration: My guide is a geologist from deep within the oil industry. Eric Streitberg is managing director of an Australian oil company, ARC Energy. He's just decided to go public with his fears. — Eric Streitberg: *The reason I feel strongly about this is that people don't understand the underlying causes of why petrol prices are going up and what the effect that could have on our lives.*

Narration: Eric is about to show me what happens when an oil field reaches peak oil. — Eric Streitberg: *The oil field was discovered in 2001 and it is now on full production doing about 6,000 barrels of oil a day, which is about 10% of Western Australia's consumption.*— Jonica Newby, Reporter: *Wow! 10%.*

Narration: When oil is first pumped, it's under pressure and comes out easily — production rises, but over time oil pressure drops. Water is pumped in to maintain pressure. At the halfway point, it reaches peak oil, and then ... — Eric Streitberg: *We're holding onto peak production at the moment, but we'll be going into the inexorable decline of all oil fields very shortly.* — Jonica Newby, Reporter: *Really, and there's nothing you can do?* — Eric Streitberg: *No. You can slow the decline but you can't stop it.*

Narration: To ram home the point, Eric takes me to an oil field that passed peak oil in 1992. — Eric Streitberg: *Jonica, this is what we are getting out of this old oil well. It's 99% water and 1% oil.* Narration: All oil fields follow the same pattern of rise, peak, then fall even if they encompass an entire nation. — The U.S. hit peak oil in 1971. The UK with its North Sea oil peaked in 1999. Australia peaked in 2000. So, when will planet Earth reach peak oil? That depends on what's really happening here. The place that provides a quarter of the world's oil... the Middle East.— Jeremy Leggett: *These governments have not let anyone in to verify how much oil they have for getting on for a quarter of a century, and in the 1980s there were some really suspicious treatment of oil reserves data. Most of the Gulf countries increased their national proved reserves supposedly in some cases by up to double, and then ever since the quoted figures have not gone down very much at all. I don't believe that for a minute.*

Narration: The dissident geologists went back to original surveys to estimate total Middle East oil. They added world known reserves and projections of all future oil to be discovered. That's how they calculated the world will reach peak oil in the next 3 years, if we're not there already. — Jeremy Leggett: *2008, maybe 2009, certainly no later than 2010. That's the point at which we will no longer be living in a world with growing supplies of generally cheap oil but instead living in a world of rapidly shrinking supplies of ever vastly more expensive oil, and that point of realisation is going to come as a real shock. Then we will see world record oil prices. Who knows how high they can go.*

Narration: So what does the mainstream think? The world's largest petroleum company is ExxonMobil-Esso. It employs 20,000 scientists to generate their own exhaustive data sets. In their Melbourne 3D seismography room, I meet head of exploration, geologist Dr Doug Schwebel. — Doug Schwebel: *OK, this is a 3-dimensional image of the geology offshore Bass Strait in Victoria.*

Narration: Doug acknowledges oil will run down eventually, he just vigorously disputes when. — Doug Schwebel: *Well, people have been predicting for over a hundred years that we're going to run out of oil. It hasn't happened. We don't think it's going to happen in the near term.*

Narration: Exxon calculates twice as much oil left in the world as the so-called "early peakers" — placing peak oil decades away. — Doug Schwebel: *I mean we're talking at least out to 2030 with what we know today, and then potentially another 20-30 years beyond that with technologies that we can envisage might exist. You know if we can improve technology by only 10%, then we can recover an additional 600 to 800 billion barrels of oil.*

Narration: If this majority view is correct, we have plenty of time for a smooth, market-driven transition to alternatives via hybrid cars. Cruising in the balm of this reassuring future, it's tempting to dismiss the "early peak" camp entirely, as a small bunch of vested interest doomsdayers; but it's not that easy.

Looming in the background of the Taiwan deal is a campaign to label China as America's next big military threat. China's recent decision to increase its military budget by 18% may sound ominous, but it must be seen in the context how low Beijing's spending is compared with the United States. The U.S. military budget is now running at \$440 billion per year, not counting the costs of the wars in Iraq and Afghanistan. That is more than five times China's \$84 billion level. Meanwhile, U.S. regional allies Australia, Taiwan, Japan, and South Korea account together for an additional \$82 billion in annual military spending, and the U.S. has plans to sell India tens of billions of dollars worth of nuclear technology and combat aircraft.

Given this spending imbalance, it would take China three decades or more of massive annual increases to catch up with spending by the U.S. and its allies — and that's assuming that China's potential adversaries stand still, which they assuredly will not.

Potential U.S. arms deals in Asia include the \$10 billion deal with Taiwan (if Taipei finally succumbs to U.S. arm twisting), access to the top-of-the-line F-22 combat aircraft for Japan, and a new tranche of U.S. fighter planes for South Korea.

Why the rush to pour U.S. arms into the region?

The answer is one part ideology and one part greed. Hard-line elements within the administration and among its allies at the Heritage Foundation and other right-wing think tanks have been busily working to portray China as the ultimate "rogue state" — a more economically vibrant version of the old Soviet Union.

This threat mongering bears little resemblance to reality, but if deals can be struck with Iran and North Korea in the next five to ten years, the U.S. will be "running out of enemies," as Colin Powell said at the end of the Cold War. Even if tensions with these two states linger, they are hardly adequate to justify a military budget that is approaching half a trillion dollars per year. Hence the need to puff up the Chinese "threat."

The ideological drive to demonize China conveniently coincides with the interests of the military-industrial complex. One day the war in Iraq will end, and arms makers and their allies in the Pentagon and on Capitol Hill will be searching for new rationales to keep weapons factories running full speed ahead. An F-22 sale to Japan may help bail out Lockheed Martin, which has seen Air Force orders drop from an original target of 750 planes to 180 or less, even as the plane's cost goes up and its performance goes down. Aircraft sales to South Korea and India could help Boeing and/or Lockheed Martin stretch production runs for their current generation fighter planes, and the controversial arms package for Taiwan will be a boon to U.S. ship and missile makers.

A different dynamic is possible. Whatever the rhetoric may be, Taiwan has large and lucrative investments in China, as does South Korea. China is the biggest market for Boeing's main civilian product — airliners, and there is a strong current among nonmilitary U.S. businesses to see China as a potential market, not a looming menace. Growing trade relations, underpinned by cultural and diplomatic interchanges, offer the best hope of heading off the plans of the "get China" crowd. Fostering a relationship between the U.S. and China in which both sides move towards greater pursuit of human rights, economic justice, and environmental responsibility will be difficult under any circumstances; but it may be next to impossible in the context of a new arms race in Asia.

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