# Case Neg – Taiwan

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#### The Republic of Taiwan should (1) transition from a system of direct disposal to reprocessing nuclear waste, (2) improve media understanding of nuclear security issues through frequent engagement, non-technical briefing materials, and their inclusion in nuclear security exercises that demonstrate concepts and principles in action, and (3) encourage the nuclear industry, nongovernmental experts, and governments to issue a joint statement in support of key steps to improve nuclear security.

#### Solves disposal problems and energy dependency

Upton 13

(Upton, John. John Upton is a freelance journalist based in New Delhi, India. His work has appeared in The New York Times and Grist. “Our Nuclear Waste is a Goldmine”. Nautilus. 2013.<http://nautil.us/issue/7/waste/our-nuclear-waste-is-a-goldmine> )

**If America’s nuclear waste could be turned into electricity, it could power the country for the next century**. More than **77,000 tons of** plutonium, americium, and other **radioactive** **leftovers** of uranium fission **have piled up** at America’s atomic power plants, turning them into radioactive waste warehouses. **Known as transuranics, these materials remain radioactive for thousands of years**, and are stored in above-ground, concrete-encased water pools and steel casks, **fueling endless political battles about where they should be buried**. In August 2013, the United States Court of Appeals for the District of Columbia Circuit ordered the government to resume planning for the Yucca Mountain dump site, but the Nuclear Regulatory Commission says it lacks the money. But **there is a better solution: Nuclear waste can be turned into electricity. A new generation of nuclear reactors**, dubbed Gen-IV reactors, **could do it with great efficiency**. In the process, **transuranics would be broken into elements that remain radioactive for a** much **shorter period of time**, thus **alleviating** both our energy and **our waste issues**. As a country, **we are sitting on a radioactive gold mine**. But the economics of mining that gold are complicated. To make the new reactors work, new economic policies have to work first. The existing U.S. nuclear reactors (and most other reactors in the world) use light-water technology in which uranium rods are dunked in water, which serves as a coolant. Uranium atoms release energy when they undergo fission: After capturing a moving neutron, they split into two new elements, releasing two or three neutrons as well as heat, which boils water into steam that spins a turbine to generate electricity.1 A series of subsequent atomic reactions creates plutonium and other elements. For the fission reaction to continue, the released neutrons need to collide with uranium atoms. But the neutrons move too quickly to be captured. They need to be slowed down, which is done by using water that surrounds the rods. The water molecules slow down the neutrons to the speed needed for a sustained fission reaction. **Only 5 percent of uranium atoms are used up by the time the rod** becomes filled with fission products and **is taken out of the reactor to be added to our stockpile of nuclear waste**. The rod’s plutonium atoms, and its remaining uranium atoms, can undergo further fission in light-water reactors, but at low efficiency. Plutonium needs fast-moving neutrons to split its atoms. Reactors with fast neutrons are called fast reactors, and Gen-IV reactors are one example. Running spent uranium rods through **Gen-IV reactors would allow the energy** in those rods **to be extracted** almost **completely. “Instead of extracting 5** or 6 **percent of the energy** out of the fuel, **you could get** much closer to **95 percent** or so,” says Paul Genoa, senior director of policy development at the Nuclear Energy Institute, a trade association for the nuclear energy industry. Furthermore, **a Gen-IV reactor would produce elements that decay** much quicker than the transuranics. “The transuranics have half-lives **in** the order of hundreds of thousands of years,” says GE Hitachi Nuclear Energy’s technology chief Eric Loewen. “But after we’ve broken them down into iodine and other elements they have half-lives in the order of **10 to 30 years.”** GE Hitachi has completed design work on a Gen-IV fast reactor called PRISM (Power Reactor Innovative Small Module), and is ready to offer it to power companies. In a PRISM reactor, plutonium fuel rods would be suspended in a mass of liquid sodium. The heat from nuclear reactions would boil the water on the outside of the reactor core’s casing; the steam would rise and spin turbines to produce electricity. The fast reactor idea isn’t new. But not a single fast reactor has been built in six decades. The first reactor built in the U.S., which began operating in 1951, was a fast reactor. It was capable of using both uranium and the plutonium produced by uranium fission reactions. Back then uranium was thought to be a rare commodity, so it was important for reactors to extract the maximum out of the fuel. When geologists discovered that Earth had plenty of uranium, it became cheap and widely used, eliminating the need for more efficient reactors. Fast reactors that used sodium also raised safety concerns. Sodium is highly combustible and reacts violently with water. Fast reactors in Russia and India had fires because of sodium leaks. But GE Hitachi says it designed PRISM to be leak-proof because the reactor would be contained inside a stainless steel case, which wouldn’t corrode. There is also a leak-detecting system. And, Loewen says that compared to light-water reactors, PRISM has safety advantages too, because the fuel, coolant, and cladding are all made of metal, which has a lower thermal resistance than water. In case of overheating it’s easier for heat to escape from the reactor vessel into the air without blowing up pumps and valves. (Lead or molten salt can also serve as coolant in fast reactors, but sodium has an important advantage—it doesn’t corrode stainless steel.)  The technical problems around fast reactors, then, have been significantly reduced. Now the main obstacle seems to lie in economics. Fast reactor technology is expensive and currently is “not economical,” says Per Peterson, a professor at the University of California at Berkeley’s Department of Nuclear Engineering. GE Hitachi’s typical water-based reactor produces 1,600 megawatts of electricity, while a PRISM unit would produce approximately 600.  It’s cheaper for the nuclear industry to build light-water reactors that produce waste than to invest in fast reactors that eat it up. Raising the wholesale price of nuclear energy is not viable when fracked natural gas keeps electricity costs low. In fact, low electricity prices have contributed to the closures or pending closures of nuclear power plants in California, Wisconsin, Vermont, Florida, and New Jersey. “The industry is in a fragile situation right now,” says Genoa of the Nuclear Energy Institute. “What we don’t want do to is be forced to bear the burden of developing this recycling technology before it’s economically feasible.” Peterson thinks the technology will naturally find its path to market. “If **fuel is easy to fabricate from recycled materials, then that will be the least expensive source,”** he says.

#### Solves corruption and deliberation

NSGEG 13 [Nuclear Security Governance Experts Group, "Promoting Greater Transparency for Effective Nuclear Security," 2012] AZ

A major challenge is using language to explain nuclear issues that a general audience can understand. The public and policymakers cannot simply be told that a facility is protected in accordance with a design basis threat. This term is too esoteric for non-experts. Different approaches are needed to convey information to citizens and policymakers at the local, state, and national levels that account for their different levels of knowledge and concern and differing roles and responsibilities. Another significant problem is the real and perceived divisions that exist between experts, nuclear energy companies, and governments. The public is more likely to view actions taken by companies to improve nuclear safety and security as legitimate if governments accept companies’ assurances and outside experts publicly agree with the companies’ course of action. This type of agreement among all the major stakeholders can build confidence and provide assurances to the public and policymakers. Assisting and educating the media in covering nuclear security issues is an important key to building confidence among these constituencies. The media is the main conduit of information for the public on these issues, but limited governmental communication, conflicting expert views, and the search for sensationalism can often influence reporting. Organizers of the 2014 NSS need to engage with journalists on the objectives of the summit and the importance of the nuclear security issue as early as possible. A year out from the summit, they should consider holding an interdisciplinary meeting (government, industry, experts, international governmental organizations, and regulators) to talk about the key issues. These discussions should not be overly focused on technical information. Information should be provided in plain language to convey the importance of the issues and to place them in a public and policy context. NSS nations and operators also can utilize emergency response exercises that regularly occur at nuclear facilities as ready-made venues for showing journalists what actions are being taken to ensure the safety and security of nuclear power plants and materials. The goal should be to show that cooperation among key parties is taking place, people are doing their jobs, and the issue is not static. Waiting until the summit arrives and forcing journalists to respond, without advance preparation, to a two-day, high profile, technical event makes it difficult to effectively communicate the importance of key issues. Recommendation 11: Convene regular interdisciplinary meetings of government officials, industry representatives, nuclear regulators, and nuclear security experts to foster stronger cooperation among responsible actors and promote better communication among them. The first should be held six months to a year before the 2014 NSS. Recommendation 12: Improve media understanding of nuclear security issues through frequent engagement, non-technical briefing materials, and their inclusion in nuclear security exercises that demonstrate concepts and principles in action. Recommendation 13: Encourage the key stakeholders—nuclear industry, nongovernmental experts, and governments—to issue a joint statement in support of key steps to improve global nuclear security

#### Fear of nuclear power driven by lack of education, not cultural difference

Ho et al 15 [Jung-Chun Ho (School of Public Health, College of Public Health and Nutrition, Taipei Medical University, Taiwan), Chiao-Tzu Patricia Lee, Shu-Fen Kao, Ruey-Yu Chen, Marco C.F. Ieong, Hung-Lun Chang, Wan-Hua Hsieh, Thung-Chiao Tseng, Cheng-Fung Lu, Suei-Loong Lin, Peter Wushou Chang,"Perceived environmental and health risks of nuclear energy in Taiwan after Fukushima nuclear disaster," Environment International, 2015] AZ

Many studies showed that people who were opposed to nuclear power plants (or had high risk perception toward nuclear power) often associated NPPs with potential nuclear accidents, waste disposal, radioactivity and nuclear safety, negative health consequences for health, negative environmental effects and socio-economic impacts (Aldrich 2012; Jenkins-Smith et al. 2011; Keller et al. 2012; Parkhill 2010). However, the information about how the above-mentioned concerns influenced lay people’s risk perception toward nuclear power was not clear. In order to fill this gap, we developed a unique indicator PRR and demonstrated that those perceived a high risk of death also appeared to be with higher PRR toward cancer. We further analyzed the overall nuclear-related concerned items associated with their PRR of cancer and death, controlling the demographic variables. It was demonstrated that nuclear accidents and potential health effects were positively associated with their PRR of cancers. As public concerns over nuclear safety and uncertain health effects attributed to radiation exposure in Taiwan inevitably intensified since the Fukushima accident (Kanda et al. 2012; Yamamura 2012), the participants in this study seemed to relate their risk of cancer incidence to recent disaster in Japan and addressed great worries about uncertain health effects. The result also evidenced that the participants who expressed higher concerns about nuclear accidents, nuclear waste disposal, potential health effects, and environmental impacts tended to perceive higher risk of death from nuclear power. This was similar to the results in Keller’s studies on the acceptance of using new-generation nuclear power plants to replace old ones (Keller et al. 2012). The emerging debates regarding the risks and benefits of nuclear power largely centered on the differences in risk perception between experts and lay people. Pro-nuclear scientists suggested that lay people often over-estimated nuclear risks. They also asserted that the benefits (such as lowering CO2 emissions, more affordable and safer energy) of using nuclear power should be acknowledged (de Groot et al. 2013; Doyle 2011; Wigg 2007). In contrast, the general public were concerned about imminent nuclear disasters and uncertain health effects (Bator 2012; Jenkins-Smith 2011). Political decisions on nuclear power are usually based on scientific reports and probabilistic risk assessments conducted by experts while paying less attention to public risk perceptions. The science-driven decisions (or “top-down” approach) would lead to a loss of trust in government and scientists and increased conflicts (Jenkins-Smith 2011; Jerónimo 2011). Therefore, risk communication needs to acknowledge the differences in risk perceptions of various stakeholders/social contexts and value the point of view of lay people(Bator 2012). A good risk communication approach also needs to incorporate stakeholder inputs and involve local people in the decision making processes of issues that concern them in order to reduce their perceived risk of NPPs (Goodfellow 2011; Skarlatidou et al. 2012).

#### Solves waste disposal

Wilson 14 [Wilson, founder of BuildingGreen, Inc. and executive editor of Environmental Building News, founded the Resilient Design Institute Alex, "Safe Storage of Nuclear Waste", Green Building Advisor, [www.greenbuildingadvisor.com/blogs/dept/energy-solutions/safe-storage-nuclear-waste SP](http://www.greenbuildingadvisor.com/blogs/dept/energy-solutions/safe-storage-nuclear-waste)//emchen)]

The big question now is how long it will be until the plant can be decommissioned and what to do with the large quantities of radioactive waste that are being stored onsite. Terrorism risks with nuclear power My concern with nuclear power has always been more about terrorism than accidents during operation or storage. I continue to worry that terrorists could gain entry to nuclear plant operations and sabotage plants from the inside — disabling cooling systems and causing a meltdown. There is also a remote risk of unanticipated natural disasters causing meltdowns or radiation release, as we saw so vividly with the Fukushima Power Plant catastrophe in Japan in March, 2011. For more than 30 years, the nuclear industry in the U.S. and nuclear regulators have been going down the wrong path with waste storage — seeking a repository where waste could be buried deep in a mountain. Nevada’s Yucca Mountain was the place of choice until… it wasn’t. Any time we choose to put highly dangerous waste in someone’s backyard, it’s bound to cause a lot of controversy, even in a sparsely populated, pro-resource-extraction place like Nevada. NIMBY opposition can be boosted by people in powerful places, and in the case of Yucca Mountain, Nevada senator Harry Reid has played such a role. (He has been the Senate Majority Leader since 2006 and served prior to that as the Minority Leader and Democratic Whip.) Aside from NIMBYism, the problem with burying nuclear waste in a mountain (like Yucca Mountain) or salt caverns (like New Mexico’s Carlsbad Caverns — an earlier option that was pursued for a while in the 1970s) is that the maximum safety is provided at Day One, and the margin of safety drops continually from there. The safety of such storage sites could be compromised over time due to seismic activity (Nevada ranks fourth among the most seismically active states), volcanism (the Yucca Mountain ridge is comprised mostly of volcanic tuff, emitted from past volcanic activity), erosion, migrating aquifers, and other natural geologic actions. A better storage option I believe a much better solution for long-term storage of high-level radioactive waste is to bury it deep under the seabed in a region free of seismic activity where sediment is being deposited and the seafloor getting thicker. In such a site, the level of protection would increase, rather than decrease, over time. In some areas of seabed, more than a centimeter of sediment is being deposited annually. Compacted over time, such sediment deposition could be several feet in a hundred years, and in the geologic time span over which radioactive waste is hazardous, hundreds to thousands of feet of protective sedimentary rock would be formed. The oil and gas industry — for better or worse — knows a lot about drilling deep holes beneath a mile or two of ocean. I suspect that the deep-sea drilling industry would love such a growth opportunity to move into seabed waste storage, and I believe the Nuclear Regulatory Commission or other agencies could do a good job regulating such work. The waste could be placed in wells extending thousands of feet below the seabed in sedimentary rock in geologically stable regions. Let's say a 3,000-foot well is drilled beneath the seabed two miles beneath the surface of the ocean. Waste could be inserted into that well to a depth of 1,000 feet, and the rest of the well capped with 2,000 feet of concrete or some other material. Hundreds of these deep-storage wells could be filled and capped, and such a sub-seabed storage field could be designated as forever off-limits. Industry or the Department of Energy would have to figure out how to package such waste for safe handling at sea, since the material is so dangerous, but I believe that is a surmountable challenge. For example, perhaps the radioactive waste could be vitrified (incorporated into molten glass-like material) to reduce leaching potential into seawater should an accident occur at sea, and that waste could be tagged with radio-frequency emitters so that any lost containers could be recovered with robotic submarines in the event of such accidents. While I’m not an expert in any of this, I’ve looked at how much money taxpayers and industry have already poured into Yucca Mountain — about $15 billion by the time the Obama Administration terminated federal funding for it in 2010, according to Bloomberg News — and the estimates for how much more it would take to get a working waste storage facility of that sort operational had risen to about $96 billion by 2008, according to the U.S. Department of Energy at the time. I believe that sub-seabed storage would be far less expensive.

### 2NR – CP Solves

#### Solves the aff ssd is able to isolate any radioactive nuclear waste from humans. Bala 2014

Amal Bala, Sub-Seabed Burial of Nuclear Waste: If the Disposal Method Could Succeed Technically, Could It Also Succeed Legally?, 41 B.C. Envtl. Aff. L. Rev. 455 (2014),SP

In general, two related methods of underwater disposal of SNF exist: dumping containers of radioactive waste into the ocean, and sub-seabed disposal. 92 The purpose of underwater disposal of SNF is the same as any other type of SNF disposal, which is to isolate radioactive waste from human contact and the environment long enough for any release of radiation to become harmless.93 The potential advantages of certain types of underwater SNF disposal for the United States could include effective containment of the waste and avoiding the controversy of a land-based national repository, such as the failed project at Yucca Mountain. 94 Underwater disposal of SNF, specifically subseabed disposal, could occur far from the coast of any state or nation and could thereby avoid the NIMBY (“not in my backyard”) syndrome, but this result is not guaranteed considering existing laws and a popular belief that Earth’s oceans are a global commons

#### Past initiatives prove that information sharing solves

NSGEG 13 [Nuclear Security Governance Experts Group, "Promoting Greater Transparency for Effective Nuclear Security," 2012] AZ

The NSS also has been a catalyst for the creation of nuclear security centers of excellence around the globe. The premise of some centers is to improve nuclear security in the country that supports them. Others can and should be more than just nationallyfocused and also play a role in supporting nuclear security information sharing. For example, one or more of the centers could create a model facility or simulation that could be used for evaluating nuclear security and transparency concepts on a national, regional, or international basis. These centers also could assemble nuclear security practitioners or a secretariat of experts to provide peer review of security approaches that are submitted for assessment. Related, the centers could be used to accredit the experts that will perform the assessments on IAEA IPPAS missions in order build expertise and allow for more assessments to be performed per year. Informal information exchanges have proven valuable in other ad hoc initiatives, such as the Global Initiative to Combat Nuclear Terrorism (GICNT) and the G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (Global Partnership). The NSS, GINCT, and Global Partnership share the common attributes of limited membership, voluntary reporting, and lack of a formal institutional grounding. In addition, there are regional nuclear organizations, including in South America and Europe, that exchange information across borders that could be used as models for regional information sharing. Despite information sharing shortcomings in the current regime, there are ways the existing structures can be used to make the system more effective and transparent.

## Disads

### China War DA

#### Taiwan Nuclearization would be the *ultimate deterrent* – reducing any likelihood of a Chinese attack against Taiwan

Mearsheimer 14, (John J. Mearsheimer is the R. Wendell Harrison Distinguished Service Professor of Political Science at the University of Chicago. He is on the advisory council of The National Interest, and his most recent book, Why Leaders Lie: The Truth About Lying in International Politics, was published in January 2011 by Oxford University Press, “Say Goodbye to Taiwan”

<http://nationalinterest.org/article/say-goodbye-taiwan-9931?page=5>, March – April 2014, //VZ)

SO FAR, the discussion about Taiwan’s future has focused almost exclusively on how the United States is likely to act toward Taiwan. However, what happens to Taiwan in the face of China’s rise also depends greatly on what policies Taiwan’s leaders and its people choose to pursue over time. There is little doubt that Taiwan’s overriding goal in the years ahead will be to preserve its independence from China. That aim should not be too difficult to achieve for the next decade, mainly because Taiwan is almost certain to maintain close relations with the United States, which will have powerful incentives as well as the capability to protect Taiwan. But after that point Taiwan’s strategic situation is likely to deteriorate in significant ways, mainly because China will be rapidly approaching the point where it can conquer Taiwan even if the American military helps defend the island. And, as noted, it is not clear that the United States will be there for Taiwan over the long term. In the face of this grim future, Taiwan has three options. First, it can develop its own nuclear deterrent. Nuclear weapons are the ultimate deterrent, and there is no question that a Taiwanese nuclear arsenal would markedly reduce the likelihood of a Chinese attack against Taiwan. Taiwan pursued this option in the 1970s, when it feared American abandonment in the wake of the Vietnam War. The United States, however, stopped Taiwan’s nuclear-weapons program in its tracks. And then Taiwan tried to develop a bomb secretly in the 1980s, but again the United States found out and forced Taipei to shut the program down. It is unfortunate for Taiwan that it failed to build a bomb, because its prospects for maintaining its independence would be much improved if it had its own nuclear arsenal. No doubt Taiwan still has time to acquire a nuclear deterrent before the balance of power in Asia shifts decisively against it. But the problem with this suggestion is that both Beijing and Washington are sure to oppose Taiwan going nuclear. The United States would oppose Taiwanese nuclear weapons, not only because they would encourage Japan and South Korea to follow suit, but also because American policy makers abhor the idea of an ally being in a position to start a nuclear war that might ultimately involve the United States. To put it bluntly, no American wants to be in a situation where Taiwan can precipitate a conflict that might result in a massive nuclear attack on the United States.

### China Accidents DA

#### Taiwan’s nuclear program is key to nuclear coop with China that ensures safety

Hongyi lai 12 [“taiwan-mainland china energy ties: cooperation and potential conflict” Asia Program Special Report May 2012] AT

Taiwan has a much longer experience with nuclear power than mainland China. Taiwan started to use nuclear power in 1977, fourteen years ahead of the mainland. It has considerable experience in the construction and safe operation of nuclear power plants. In 2010, nuclear power accounted for 8.3 percent of energy production in Taiwan. In contrast, nuclear power constituted merely 0.8 percent of the mainland’s energy consumption back in 2008.11 Taiwan can thus provide useful experience for the mainland and cooperate with the mainland in the use and development of nuclear power.12 In the wake of Japan’s nuclear power station explosions and leakage in March 2011, the mainland and Taiwan have paid more attention to the issue of nuclear safety. In May 2011, at the CrossStrait Economic, Trade and Culture Forum in Chengdu, the capital of Sichuan Province, the mainland and Taiwan jointly proposed to establish information sharing mechanisms to ensure the safety of nuclear power.13

#### Unsafe Chinese reactors cause nuclear terror

Joe Mcdonald 16 [(Joe Mcdonald, ) China's nuclear power ambitions sailing into troubled waters, No Publication 7-31-2016] AT

"The security concerns are clear: such reactors would be tempting targets for military or terrorist attacks," Edwin Lyman, a nuclear specialist for the Union of Concerned Scientists in Washington, said in an email. "Maintaining the full contingent of security officers necessary to effectively deter attack would not be feasible." Other perils include stormy seas—the South China Sea is buffeted by powerful seasonal typhoons—and the need to exchange radioactive fuel at distant sites. CGN says its seaborne unit will have "passive safety," or features that function without moving parts or outside power, such as control rods that drop by gravity in an emergency. No commercial reactor operates with such features. "There are questions about how reliable passive safety systems will be in extreme conditions," Lyman said. CGN wants to simplify operations by requiring refueling only once every three years instead of the industry standard of 18 months, Luk said. That would require more highly enriched fuel, with the amount of the U-235 isotope raised to as much as 10 percent from the typical 4.5 percent. "If it were seized by terrorists or someone else, that would be a big problem," he said.

#### Nuclear war

Barrett et al 13—PhD in Engineering and Public Policy from Carnegie Mellon University, Fellow in the RAND Stanton Nuclear Security Fellows Program, and Director of Research at Global Catastrophic Risk Institute—AND Seth Baum, PhD in Geography from Pennsylvania State University, Research Scientist at the Blue Marble Space Institute of Science, and Executive Director of Global Catastrophic Risk Institute—AND Kelly Hostetler, BS in Political Science from Columbia and Research Assistant at Global Catastrophic Risk Institute (Anthony, 24 June 2013, “Analyzing and Reducing the Risks of Inadvertent Nuclear War Between the United States and Russia,” Science & Global Security: The Technical Basis for Arms Control, Disarmament, and Nonproliferation Initiatives, Volume 21, Issue 2, Taylor & Francis)

War involving significant fractions of the U.S. and Russian nuclear arsenals, which are by far the largest of any nations, could have globally catastrophic effects such as severely reducing food production for years, 1 potentially leading to collapse of modern civilization worldwide, and even the extinction of humanity. 2 Nuclear war between the United States and Russia could occur by various routes, including accidental or unauthorized launch; deliberate first attack by one nation; and inadvertent attack. In an accidental or unauthorized launch or detonation, system safeguards or procedures to maintain control over nuclear weapons fail in such a way that a nuclear weapon or missile launches or explodes without direction from leaders. In a deliberate first attack, the attacking nation decides to attack based on accurate information about the state of affairs. In an inadvertent attack, the attacking nation mistakenly concludes that it is under attack and launches nuclear weapons in what it believes is a counterattack. 3 (Brinkmanship strategies incorporate elements of all of the above, in that they involve intentional manipulation of risks from otherwise accidental or inadvertent launches. 4 ) Over the years, nuclear strategy was aimed primarily at minimizing risks of intentional attack through development of deterrence capabilities, and numerous measures also were taken to reduce probabilities of accidents, unauthorized attack, and inadvertent war. For purposes of deterrence, both U.S. and Soviet/Russian forces have maintained significant capabilities to have some forces survive a first attack by the other side and to launch a subsequent counter-attack. However, concerns about the extreme disruptions that a first attack would cause in the other side's forces and command-and-control capabilities led to both sides’ development of capabilities to detect a first attack and launch a counter-attack before suffering damage from the first attack. 5 Many people believe that with the end of the Cold War and with improved relations between the United States and Russia, the risk of East-West nuclear war was significantly reduced. 6 However, it also has been argued that inadvertent nuclear war between the United States and Russia has continued to present a substantial risk. 7 While the United States and Russia are not actively threatening each other with war, they have remained ready to launch nuclear missiles in response to indications of attack. 8 False indicators of nuclear attack could be caused in several ways. First, a wide range of events have already been mistakenly interpreted as indicators of attack, including weather phenomena, a faulty computer chip, wild animal activity, and control-room training tapes loaded at the wrong time. 9 Second, terrorist groups or other actors might cause attacks on either the United States or Russia that resemble some kind of nuclear attack by the other nation by actions such as exploding a stolen or improvised nuclear bomb, 10 especially if such an event occurs during a crisis between the United States and Russia. 11 A variety of nuclear terrorism scenarios are possible. 12 Al Qaeda has sought to obtain or construct nuclear weapons and to use them against the United States. 13 Other methods could involve attempts to circumvent nuclear weapon launch control safeguards or exploit holes in their security. 14 It has long been argued that the probability of inadvertent nuclear war is significantly higher during U.S.–Russian crisis conditions, 15 with the Cuban Missile Crisis being a prime historical example. It is possible that U.S.–Russian relations will significantly deteriorate in the future, increasing nuclear tensions. There are a variety of ways for a third party to raise tensions between the United States and Russia, making one or both nations more likely to misinterpret events as attacks. 16

#### Nuclear meltdowns destroy the environment

Stapleton 9 - Richard M Stapleton Is the author of books such as Lead Is a Silent Hazard, writes for pollution issues (“Disasters: Nuclear Accidents” <http://www.pollutionissues.com/Co-Ea/Disasters-Nuclear-Accidents.html>) RMT

Of all the environmental disaster events that humans are capable of causing, nuclear disasters have the greatest damage potential. The radiation release associated with a nuclear disaster poses significant acute and chronic risks in the immediate environs and chronic risk over a wide geographic area. Radioactive contamination, which typically becomes airborne, is long-lived, with half-lives guaranteeing contamination for hundreds of years. Concerns over potential nuclear disasters center on nuclear reactors, typically those used to generate electric power. Other concerns involve the transport of nuclear waste and the temporary storage of spent radioactive fuel at nuclear power plants. The fear that terrorists would target a radiation source or create a "dirty bomb" capable of dispersing radiation over a populated area was added to these concerns following the 2001 terrorist attacks on New York City and Washington, D.C. Radioactive emissions of particular concern include strontium-90 and cesium-137, both having thirty-year-plus half-lives, and iodine-131, having a short half-life of eight days but known to cause thyroid cancer. In addition to being highly radioactive, cesium-137 is mistaken for potassium by living organisms. This means that it is passed on up the food chain and bioaccumulated by that process. Strontium-90 mimics the properties of calcium and is deposited in bones where it may either cause cancer or damage bone marrow cells.

#### Ocean bioD loss causes extinction

Craig 3 [Robin Craig, Indiana University, Robin Kundis, Winter, 34 McGeorge L. Rev. 155, p. 264-266]

Biodiversity and ecosystem function arguments for conserving marine ecosystems also exist, just as they do for terrestrial ecosystems, but these arguments have thus far rarely been raised in political debates. For example, besides significant tourism values - the most economically valuable ecosystem service coral reefs provide, worldwide - coral reefs protect against storms and dampen other environmental fluctuations, services worth more than ten times the reefs' value for food production. Waste treatment is another significant, non-extractive ecosystem function that intact coral reef ecosystems provide. More generally, "ocean ecosystems play a major role in the global geochemical cycling of all the elements that represent the basic building blocks of living organisms, carbon, nitrogen, oxygen, phosphorus, and sulfur, as well as other less abundant but necessary elements." In a very real and direct sense, therefore, human degradation of marine ecosystems impairs the planet's ability to support life. Maintaining biodiversity is often critical to maintaining the functions of marine ecosystems. Current evidence shows that, in general, an ecosystem's ability to keep functioning in the face of disturbance is strongly dependent on its biodiversity, "indicating that **more diverse ecosystems are more stable**." Coral reef ecosystems are particularly dependent on their biodiversity. Most ecologists agree that the complexity of interactions and degree of interrelatedness among component species is higher on coral reefs than in any other marine environment. This implies that the ecosystem functioning that produces the most highly valued components is also complex and that many otherwise insignificant species have strong effects on sustaining the rest of the reef system. Thus, maintaining and restoring the biodiversity of marine ecosystems is critical to maintaining and restoring the ecosystem services that they provide. Non-use biodiversity values for marine ecosystems have been calculated in the wake of marine disasters, like the Exxon Valdez oil spill in Alaska. Similar calculations could derive preservation values for marine wilderness. However, economic value, or economic value equivalents, should not be "the sole or even primary justification for conservation of ocean ecosystems. Ethical arguments also have considerable force and merit." At the forefront of such arguments should be a recognition of how little we know about the sea - and about the actual effect of human activities on marine ecosystems. The United States has traditionally failed to protect marine ecosystems because it was difficult to detect anthropogenic harm to the oceans, but we now know that such harm is occurring - even though we are not completely sure about causation or about how to fix every problem. Ecosystems like the NWHI coral reef ecosystem should inspire lawmakers and policymakers to admit that most of the time we really do not know what we are doing to the sea and hence should be preserving marine wilderness whenever we can - especially when the United States has within its territory relatively pristine marine ecosystems that may be unique in the world. We may not know much about the sea, but we do know this much: if we kill the ocean we kill ourselves, and we will take most of the biosphere with us**.** The Black Sea is almost dead, its once-complex and productive ecosystem almost entirely replaced by a monoculture of comb jellies, "starving out fish and dolphins, emptying fishermen's nets, and converting the web of life into brainless, wraith-like blobs of jelly." More importantly, the Black Sea is not necessarily unique. The Black Sea is a microcosm of what is happening to the ocean systems at large. The stresses piled up: overfishing, oil spills, industrial discharges, nutrient pollution, wetlands destruction, the introduction of an alien species. The sea weakened, slowly at first, then collapsed with shocking suddenness. The lessons of this tragedy should not be lost to the rest of us, because much of what happened here is being repeated all over the world. The ecological stresses imposed on the Black Sea were not unique to communism. Nor, sadly, was the failure of governments to respond to the emerging crisis. Oxygen-starved "dead zones" appear with increasing frequency off the coasts of major cities and major rivers, forcing marine animals to flee and killing all that cannot. Ethics as well as enlightened self-interest thus suggest that the United States should protect fully-functioning marine ecosystems wherever possible - even if a few fishers go out of business as a result.

### Warming DA

#### Nuclear power is key to Taiwan – no other type of power is feasible

Stromberg 15 [Stephen Stromberg (member of The Post’s editorial board), "The world can’t shun nuclear power," Washington Post, 5/1/2015] AZ

Tackling climate change using all the technologies we have will be hard enough. Trying to do it while swearing off nuclear power would be plainly ridiculous. That’s the lesson from Taiwan, a densely packed island state with few natural resources and a rising aversion to reactors.

Taiwan “cannot really be picky about energy,” President Ma Ying-jeou told me in an interview this week. But the Taiwanese behave as though they can. Taiwan faces many constraints, some natural, some self-imposed, explained Chien You-hsin, a former environmental minister: Most people understand that greenhouse-gas emissions warm the planet, but they fear nuclear power, refuse to live near onshore wind turbines, insist that offshore wind platforms not disturb aquatic habitats and lack wide-open spaces for solar generation. Meanwhile, the biggest share of the island’s electricity comes from burning dirty coal. In one key way, the Taiwanese attitude resembles that of people in Japan and Germany: Their advanced economies depend on abundant energy, but they recoil from the choices that reality entails, with counterproductive results.

Taiwan imports about 98 percent of its energy supplies, mostly the fossil fuels that keep its fluorescent streetscapes flashing and its many factories humming. It burns lots of coal and large amounts of natural gas, which is cleaner than coal but still produces carbon-dioxide emissions. Relying on fossil fuels also makes the island vulnerable: Its shipped-in supplies could run dangerously low in a major storm, Ma said.

The small island — it is slightly smaller than Maryland and Delaware combined — can’t produce more than a meager amount of hydropower. Solar power not only requires lots of area but also is not as much help during the rainy season. Taiwan has between 300 and 400 onshore wind turbines, but siting restrictions will make it difficult to add many more, according to Wang Ren-chain of the Industrial Technology Research Institute, a state-supported research group. His outfit is looking at installing offshore turbines, but that technology presents ecological concerns and is expensive. New technology might ease the constraints, eventually. But, for now, even if the government meets its deployment goals by 2030, renewable energy would generate only about 12 percent of the island’s electricity, the institute reckons.

That leaves nuclear power. Three nuclear plants currently provide 18 percent of Taiwan’s electricity. They don’t require large-scale fuel imports and produce virtually no carbon emissions. Unsurprisingly, the government concluded that the island needs more of them, and Taiwan began work on a fourth station that would house two reactors and supply some 9 percent of the island’s electricity. Work was nearly finished on the first reactor when the government halted the project last year in response to huge street protests. Now, with a large investment made, the reactor sits unused, waiting for the island to have the sense to insert the fuel rods.

Ma insisted that the government hasn’t scrapped the project. It can be activated in short order if future conditions demand. It’s hard to see how they wouldn’t. Yet in the same breath he declared that the government’s ultimate goal is a full transition off nuclear power. What Ma says also might not matter much; the anti-nuclear opposition party is poised to do well in presidential elections next year, and whoever’s in charge will be constrained by the public mood.

#### The plan increases emissions – they shift to coal not renewables

Chen 12 [Y.H. Henry Chen (Taiwan Business Topics magazine’s associate editor and reporter. Prior to joining Taiwan Business Topics magazine in 2014, Tim was a frequent contributor, focusing primarily on issues related to energy, economy and technology), "Non-Nuclear, Low-Carbon, or Both? The Case of Taiwan," MIT Joint Program on the Science and Policy of Global Change, December 2012] AZ

Under the non-nuclear policy scenario, fossil-based generation will replace part of the lost electricity output, and this will lead to an increase in Taiwan’s total CO2 emissions, as shown in Figure 7a. While electricity sectors, especially coal-fired power, will contribute to most of the additional emissions, a slight increase in emissions from other industrial sectors reflects that electricity input is substituted by other fossil-based energy input. Figure 7b shows that Taiwan’s total CO2 emissions may increase by more than 3.5% relative to BAU levels from 2035 onwards. The emissions increase is not trivial, which suggests that when pursuing the non-nuclear policy, it is also important to consider effective measures that could curb CO2 emissions.

#### Global warming definitively causes extinction

Sharp and Kennedy 14 – (Associate Professor Robert (Bob) A. Sharp is the UAE National Defense College Associate Dean for Academic Programs and College Quality Assurance Advisor. He previously served as Assistant Professor of Strategic Security Studies at the College of International Security Affairs (CISA) in the U.S. National Defense University (NDU), Washington D.C. and then as Associate Professor at the Near East South Asia (NESA) Center for Strategic Studies, collocated with NDU. Most recently at NESA, he focused on security sector reform in Yemen and Lebanon, and also supported regional security engagement events into Afghanistan, Turkey, Egypt, Palestine and Qatar; Edward Kennedy is a renewable energy and climate change specialist who has worked for the World Bank and the Spanish Electric Utility ENDESA on carbon policy and markets; 8/22/14, “Climate Change and Implications for National Security,” *International Policy Digest*, <http://intpolicydigest.org/2014/08/22/climate-change-implications-national-security/>, Accessed 7/11/16, HWilson)

Our planet is 4.5 billion years old. If that whole time was to be reflected on a single one-year calendar then the dinosaurs died off sometime late in the afternoon of December 27th and modern humans emerged 200,000 years ago, or at around lunchtime on December 28th. Therefore, human life on earth is very recent. Sometime on December 28th humans made the first fires – wood fires – neutral in the carbon balance.

Now reflect on those most recent 200,000 years again on a single one-year calendar and you might be surprised to learn that the industrial revolution began only a few hours ago during the middle of the afternoon on December 31st, 250 years ago, coinciding with the discovery of underground carbon fuels.

Over the 250 years carbon fuels have enabled tremendous technological advances including a population growth from about 800 million then to 7.5 billion today and the consequent demand to extract even more carbon. This has occurred during a handful of generations, which is hardly noticeable on our imaginary one-year calendar. The release of this carbon – however – is changing our climate at such a rapid rate that it threatens our survival and presence on earth. It defies imagination that so much damage has been done in such a relatively short time. The implications of climate change is the single most significant threat to life on earth and, put simply, we are not doing enough to rectify the damage.

This relatively very recent ability to change our climate is an inconvenient truth; the science is sound. We know of the complex set of interrelated national and global security risks that are a result of global warming and the velocity at which climate change is occurring. We worry it may already be too late.

Climate change writ large has informed few, interested some, confused many, and polarized politics. It has already led to an increase in natural disasters including but not limited to droughts, storms, floods, fires etc. The year 2012 was among the 10 warmest years on record according to an American Meteorological Society (AMS) report. Research suggests that climate change is already affecting human displacement; reportedly 36 million people were displaced in 2008 alone because of sudden natural disasters. Figures for 2010 and 2011 paint a grimmer picture of people displaced because of rising sea levels, heat and storms.

Climate change affects all natural systems. It impacts temperature and consequently it affects water and weather patterns. It contributes to desertification, deforestation and acidification of the oceans. Changes in weather patterns may mean droughts in one area and floods in another. Counter-intuitively, perhaps, sea levels rise but perennial river water supplies are reduced because glaciers are retreating.

As glaciers and polar ice caps melt, there is an albedo effect, which is a double whammy of less temperature regulation because of less surface area of ice present. This means that less absorption occurs and also there is less reflection of the sun’s light. A potentially critical wild card could be runaway climate change due to the release of methane from melting tundra. Worldwide permafrost soils contain about 1,700 Giga Tons of carbon, which is about four times more than all the carbon released through human activity thus far.

The planet has already adapted itself to dramatic climate change including a wide range of distinct geologic periods and multiple extinctions, and at a pace that it can be managed. It is human intervention that has accelerated the pace dramatically: An increased surface temperature, coupled with more severe weather and changes in water distribution will create uneven threats to our agricultural systems and will foster and support the spread of insect borne diseases like Malaria, Dengue and the West Nile virus. Rising sea levels will increasingly threaten our coastal population and infrastructure centers and with more than 3.5 billion people – half the planet – depending on the ocean for their primary source of food, ocean acidification may dangerously undercut critical natural food systems which would result in reduced rations.

Climate change also carries significant inertia. Even if emissions were completely halted today, temperature increases would continue for some time. Thus the impact is not only to the environment, water, coastal homes, agriculture and fisheries as mentioned, but also would lead to conflict and thus impact national security. Resource wars are inevitable as countries respond, adapt and compete for the shrinking set of those available resources. These wars have arguably already started and will continue in the future because climate change will force countries to act for national survival; the so-called Climate Wars.

As early as 2003 Greenpeace alluded to a report which it claimed was commissioned by the Pentagon titled: An Abrupt Climate Change Scenario and Its Implications for U.S. National Security. It painted a picture of a world in turmoil because global warming had accelerated. The scenario outlined was both abrupt and alarming. The report offered recommendations but backed away from declaring climate change an immediate problem, concluding that it would actually be more incremental and measured; as such it would be an irritant, not a shock for national security systems.

In 2006 the Center for Naval Analyses (CNA) – Institute of Public Research – convened a board of 11 senior retired generals and admirals to assess National Security and the Threat to Climate Change. Their initial report was published in April 2007 and made no mention of the potential acceleration of climate change. The team found that climate change was a serious threat to national security and that it was: “most likely to happen in regions of the world that are already fertile ground for extremism.” The team made recommendations from their analysis of regional impacts which suggested the following. Europe would experience some fracturing because of border migration. Africa would need more stability and humanitarian operations provided by the United States. The Middle East would experience a “loss of food and water security (which) will increase pressure to emigrate across borders.” Asia would suffer from “threats to water and the spread of infectious disease. ” In 2009 the CIA opened a Center on Climate Change and National Security to coordinate across the intelligence community and to focus policy.

In May 2014, CNA again convened a Military Advisory Board but this time to assess National Security and the Accelerating Risk of Climate Change. The report concludes that climate change is no longer a future threat but occurring right now and the authors appeal to the security community, the entire government and the American people to not only build resilience against projected climate change impacts but to form agreements to stabilize climate change and also to integrate climate change across all strategy and planning. The calm of the 2007 report is replaced by a tone of anxiety concerning the future coupled with calls for public discourse and debate because “time and tide wait for no man.”

The report notes a key distinction between resilience (mitigating the impact of climate change) and agreements (ways to stabilize climate change) and states that:

Actions by the United States and the international community have been insufficient to adapt to the challenges associated with projected climate change. Strengthening resilience to climate impacts already locked into the system is critical, but this will reduce long-term risk only if improvements in resilience are accompanied by actionable agreements on ways to stabilize climate change.

The 9/11 Report framed the terrorist attacks as less of a failure of intelligence than a failure of imagination. Greenpeace’s 2003 account of the Pentagon’s alleged report describes a coming climate Armageddon which to readers was unimaginable and hence the report was not really taken seriously. It described:

A world thrown into turmoil by drought, floods, typhoons. Whole countries rendered uninhabitable. The capital of the Netherlands submerged. The borders of the U.S. and Australia patrolled by armies firing into waves of starving boat people desperate to find a new home. Fishing boats armed with cannon to drive off competitors. Demands for access to water and farmland backed up with nuclear weapons.

The CNA and Greenpeace/Pentagon reports are both mirrored by similar analysis by the World Bank which highlighted not only the physical manifestations of climate change, but also the significant human impacts that threaten to unravel decades of economic development, which will ultimately foster conflict.

Climate change is the quintessential “Tragedy of the Commons,” where the cumulative impact of many individual actions (carbon emission in this case) is not seen as linked to the marginal gains available to each individual action and not seen as cause and effect. It is simultaneously huge, yet amorphous and nearly invisible from day to day. It is occurring very fast in geologic time terms, but in human time it is (was) slow and incremental. Among environmental problems, it is uniquely global. With our planet and culture figuratively and literally honeycombed with a reliance on fossil fuels, we face systemic challenges in changing the reliance across multiple layers of consumption, investment patterns, and political decisions; it will be hard to fix!

#### Taiwan key – it's a model for developing nations

EPA Taiwan 9 [Environmental Protection Administration Taiwan, "Toward UNFCCC," 2009] AZ

What assistance will Taiwan need from international community before participating in the UNFCCC? Taiwan’s absence in the UNFCCC has created a noticeable gap in the global efforts in combating climate change. To ensure success of combating global warming by the international community, Taiwan should not be excluded. We are fully aware of our obligations on the global environmental issues and are willing to assume our long-term on-going commitments to environmental sustainability efforts in sharing reduction obligations to avoid emissions from Taiwan turning into a global carbon leakage. In order to fulfill the obligations and efforts of a member of the global village, Taiwan’s experience in implementing energy conservation and carbon reduction work can provide valuable references for many countries and organizations that are making efforts to improve economic development and welfare of the people. Based on these, we urge all countries in the world, in consideration of protection of the living condition for human co-existence, to provide us with the opportunity to fairly participate in all mechanisms, meetings and activities in the prevention of potential global environmental disasters, as well as jointly combat global warming with the international community in addition to our active participation in greenhouse gas reduction and capacity building activities. We look forward to the international community’s understanding of Taiwan's situation, as Taiwan is integrated into the framework of global response to climate change for its genuine contributions.

What can Taiwan contribute? The people of Taiwan are always hard at work, and we believe we have a lot to contribute to the world community. From the depth of underdevelopment in the middle of the 20th century, we have overcome numerous challenges to build an economy that is known today for its innovations and technologies. However, the process of industrialization also brought severe pressure to our environment and ecosystems. What Taiwan has experienced and learned, both from its successes and the difficulties, will likely be experienced by the many developing economies of the world that are themselves working hard to improve their economy. In this sense, we have a lot to share with them, both in economic development and environmental management, and to assist them in their journey. We are confident we will be a very positive factor in any UN organization we are accepted to join.

#### Nuclear power stops dangerous quantities of emissions

Biello 13 – David, writes for the scientific American, Internally Cites James Hansen, Professor at Columbia University (“How Nuclear Power Can Stop Global Warming” <http://www.scientificamerican.com/article/how-nuclear-power-can-stop-global-warming/>) RMT

In addition to reducing the risk of nuclear war, U.S. reactors have also been staving off another global challenge: climate change. The low-carbon electricity produced by such reactors provides 20 percent of the nation's power and, by the estimates of climate scientist James Hansen of Columbia University, avoided 64 billion metric tons of greenhouse gas pollution. They also avoided spewing soot and other air pollution like coal-fired power plants do and thus have saved some 1.8 million lives.

And that's why Hansen, among others, such as former Secretary of Energy Steven Chu, thinks that nuclear power is a key energy technology to fend off catastrophic climate change. "We can't burn all these fossil fuels," Hansen told a group of reporters on December 3, noting that as long as fossil fuels are the cheapest energy source they will continue to be burned. "Coal is almost half the [global] emissions. If you replace these power plants with modern, safe nuclear reactors you could do a lot of [pollution reduction] quickly."

Indeed, he has evidence: the speediest drop in greenhouse gas pollution on record occurred in France in the 1970s and ‘80s, when that country transitioned from burning fossil fuels to nuclear fission for electricity, lowering its greenhouse emissions by roughly 2 percent per year. The world needs to drop its global warming pollution by 6 percent annually to avoid "dangerous" climate change in the estimation of Hansen and his co-authors in a recent paper in PLoS One. "On a global scale, it's hard to see how we could conceivably accomplish this without nuclear," added economist and co-author Jeffrey Sachs, director of the Earth Institute at Columbia University, where Hansen works.

#### Taiwanese air pollution uniquely risks cancer exposure

Cheng 93 - Chao-chan Cheng is Professor, Sun Yat-sen Center for Policy Studies, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC. Known as Akira Harimoto, Dr. Cheng is a native of Taiwan and a naturalized Japanese citizen. Abstract: Taiwan and Japan have faced similar environmental problems at comparable stages in their economic development, and have passed through similar stages in the development of their systems of environmental law. Three phases in the development of environmental law making are distinguished: preparatoryf, ormative and developed. This article compares the relative progress of Taiwan and Japan through these stages, and suggests that Taiwan may benefit by studying Japan's analogous prior experiences with pollution prevention and environmental law. A COMPARATIVE STUDY OF THE FORMATION AND DEVELOPMENT OF AIR & WATER POLLUTION CONTROL LAWS IN TAIWAN AND JAPAN Copyright @ 1993 Pacific Rim Law & Policy Association

Air pollution is also severe and getting worse. Citing an EPA report, one article noted that "the spread of NO2, CO, 03, dust, and SO 2 in the Taipei Basin, including Taipei City and Taipei County, is such that these areas are now classified as third-level control regions (pollution most severe), primarily because automobile exhausts do not readily dissipate." 65

The sources and variety of pollutants are increasing too. For instance, in May of 1991 airborne dioxin pollution in Nan-Tzu Kaohsiung caused by the burning of electrical cables affected more than two thousand students and teachers of the K'o-Liao Elementary School. 66 In an accident affecting even more people, a chloride leak at the Handy Chemical Corporation Ltd. in Kaohsiung caused more than seven thousand people to seek emergency treatment in April 1992.67 Radioactive steel bars were discovered in the structure of a building on Long Chiang Street in Taipei in September 1992.68 Finally, in May 1992 the burning of waste circuit board material resulted in a second dioxin air pollution emergency near the K'o-Liao Elementary School which affected more than six hundred students at the school. The manufacturer of the circuit boards, Wu's Printed Circuit Company Ltd., was punished by the Kaohsiung City Bureau of Environmental Protection. 69 Furthermore, most of these types of pollution have measurable impacts on public health. For instance, the Public Sanitary Institute of Taiwan University estimates that because of exposure to high levels of benzene in vehicle exhausts, the cancer rate for students riding motorcycles is between 19/106 and 130/106, and between 66/106 and 130/106 for workers riding motorcycles.70

### A2 Renewables

#### No renewables

Liao & Jhou 13 [Huei-Chu Liao and Sih Ting Jhou, "Taiwan’s Severe Energy Security Challenges," Brookings Institution, 9/12/2013] AZ

2. Unlikely mission for 100 percent renewable energy

Many people in Taiwan hope that development of renewable energy will solve the island’s energy problem, and environmental groups are pushing the government to pursue the 100 percent renewable energy use in the future. In 2012, the relative share of renewable energy accounted for only 1.89 percent of Taiwan’s total energy supply; biomass and waste accounted for 1.32 percent, conventional hydro power 0.38 percent, solar photovoltaic (PV) and wind power 0.11 percent, and solar thermal 0.08 percent (see Figure 1). Among renewable sources, the Taiwan government currently prioritizes wind and solar power, but both face development obstacles.

Although the generation cost of wind power is competitive with that of traditional fossil energy, Taiwan’s terrain and small size limit suitable locations for building up onshore wind power facilities. In fact, complaints and protests from areas that already host wind power facilities are increasing. Offshore wind power also faces challenges; fishermen and coastal area environmental protection groups have raised many questions and concerns. Currently, no offshore wind power sites have been built.

The development of solar power is also problematic. The generation cost of solar PV power is two to three times that of fossil energy. People in Taiwan are unlikely to accept yet another increase in electricity prices that a shift to solar power would entail. As with wind power, land limitation is another constraint for building more solar PV.

The intermittent characteristics of both wind and solar power present yet another complication. Intermittent power supply will reduce the power supply reliability, which is particularly unacceptable for many high technology industries such as the electronic products industry which is important to Taiwan’s economy. Taiwan is an island, and the physical isolation makes intermittent power even more unfavorable. It is impossible for Taiwan to sell or buy power to balance the surplus or shortage of intermittent power supply.

Except for wind, solar, hydro-power (which accounts for a very small share), most of the other potential sources of renewable energy remain in the research or demonstration stages. Ocean energy and deep geothermal energy are two sources that could be beneficial for Taiwan, but they need to be developed.

In brief, the poor economic, environmental and geographic conditions in Taiwan limit the possibilities for renewable energy, and it will be all but impossible to reach the aim of 100 percent renewable energy use before 2050.

#### Energy demand increasing in Taiwan – forces a shift to coal and rapidly increases emissions

Ferry 15 [Tim Ferry, "Taiwan’s Energy Dilemma: Emission Reductions vs. Dwindling Supply," Taiwan Business Topics, 9/15/2015] AZ

More importantly, though, Taiwan’s energy demand has continued to rise alongside economic growth, but almost no new power-generating capacity has been added in recent years, bringing Taiwan’s effective reserve margin to dangerously low levels. Demand for primary energy has increased over the past decade by an average of 1.9% annually, while power demand increased 1.8% year-on-year in 2013 after a slight dip in 2012, and the release of 2014 statistics will likely show a further increase. With Taiwan’s aging fleet of nuclear reactors nearing retirement starting in 2017, and with little push for license extensions that would enable them to continue generating power for another 20 years, Taiwan stands to lose some 18% of its power generation. Only part of that shortfall can be made up by coal-fired units currently under construction or planning, and these projects are also likely to meet opposition from environmentalists.

These developments will make it harder for Taiwan to meet its commitments under its greenhouse gas (GHG) emissions-reduction strategy.

The desire to honor its role as a developed economy in the fight against global warming – while still maintaining a sufficient and affordable energy supply – is the core of Taiwan’s energy challenge. The issues involved are always highly political, and can be expected to become even more so as Taiwan nears the presidential and legislative elections next January. Both the ruling Kuomintang (KMT) and opposition Democratic Progressive Party (DPP) agree that Taiwan needs to reduce its energy demand and carbon footprint, and the stated goals of both parties with regard to promoting renewable energy are also quite similar.

#### Increases CO2 emissions

Chen 12 [Y.H. Henry Chen (Taiwan Business Topics magazine’s associate editor and reporter. Prior to joining Taiwan Business Topics magazine in 2014, Tim was a frequent contributor, focusing primarily on issues related to energy, economy and technology), "Non-Nuclear, Low-Carbon, or Both? The Case of Taiwan," MIT Joint Program on the Science and Policy of Global Change, December 2012] AZ

In this study, I provide an economy-wide analysis for Taiwan under the low-carbon growth path with or without the nuclear option, and improve the modeling for the dependency of nondispatchable generation (wind power in particular) on other dispatchable generation. Pursuing a low-carbon world without the nuclear option requires a huge change in industrial structure and a significant decrease in GDP growth, as carbon-intensive activities will be discouraged. Under this scenario, the electricity supply will also decrease significantly relative to the BAU level—an outcome reflecting that, in Taiwan, expansions of renewable generation such as hydro and wind are limited by resources and technological constraints. If the nuclear option is on the table, the negative impact on the economy is reduced, but this would require the assurance that nuclear power could avoid disasters such as the one at Fukushima, and that disposal of nuclear wastes is no longer an issue. Lastly, the analysis models Taiwan as a small open economy. One result of this is that we see large effects on trade. While this study does not explicitly model the rest of the world, the likely implication is carbon leakage. If the rest of the world were also to pursue lowcarbon policies, there would be fewer channels for Taiwan to reduce its CO2 mitigation costs through trade. While for Taiwan, carrying out the low-carbon target without the nuclear option could be expensive, the costs may be lowered through opportunities such as purchasing cheaper emissions allowances from abroad whenever possible, which could be an extension for future research. Another extension is to come up with a better representation for the production structure of industrial sectors since the one used in this research may not fully represent the technical opportunity for substituting away from fossil fuels that incur higher carbon penalties. Finally, future research could also consider the potential roles of technical innovations. For instance, recent research funded by the National Science Council argues that in Taiwan, geothermal power may have the capacity of up to 25.4 GWe—almost ten times that of Longmen Nuclear Power Station (Radio Taiwan International, 2011). Technology innovations, once viable, may significantly lower the cost of pursuing the non-nuclear and low-carbon policies.

#### Taiwan shift to full-scale thermal plants are worse

Hwang 94 [Dangerous Choice or Best Option? Jim Hwang. October 1, 1994] MSG

But there is also a strong body of support for the new nuclear power plant. Those in the power generation industry believe that an additional nuclear power plant is not only necessary, but is more friendly to the environment than thermal plants. In June, as the budget vote neared, the presidents of several major industrial groups visited the Legislature to voice their support for the new plant. Later that month, about two thousand Taipower employees also held a pro-nuclear demonstration in Taipei.¶ Dangerous¶ T.R. Ho, superintendent of the Second Nuclear Power Station, says those who work in nuclear power plants experience harmless amounts of radiation—"I myself would quit immediately if it wasn't safe."¶ "We are not saying that nuclear is the only power source," says Richard Hsu (徐錦棠), a chief engineer at Taipower. "But it is an option that Taiwan can't afford not to exploit." Hsu points out that hydropower is unreliable due to Taiwan's seasonal droughts, and that all of the resources used to create thermal power—coal, oil, and natural gas—must be imported. More than half of Taiwan's electrical power now comes from oil and coal. If shipments of these were cut off because of, say, war in the Middle East, local power would be seriously affected. Thus, Hsu believes it is necessary for Taipower to develop alternative power sources, including nuclear power.¶ Besides providing a stable power supply, nuclear energy is also Taiwan's least expensive power resource. From 1982 to 1993, the average cost of producing one kWh was 3.6 cents from nuclear power, 3.9 cents from coal, and 4.7 cents from oil. (These costs include the expense of building a nuclear plant and of storing radiation waste.) The two reactors in the Second Nuclear Power Station require 60 tons of nuclear fuel every year. To generate the same amount of electricity, a thermal plant needs 4.2 million tons of coal, 2.8 million tons of oil, or 2 million tons of natural gas. Put another way, while a nuclear power plant refuels once a year, a thermal plant requires a constant supply equal to a 20-ton coal tender arriving every two minutes.

## Case

### Case – O/V

#### The aff's not inherent – two implications

#### Taiwan will phase reactors out in 2025 anyway, so they need to win that now is key

#### Reject the aff – the neg has no disad ground since the aff isn't a prohibition – it just accelerates an existing law

### A2 Prolif Advantage

#### Taiwan is rational with nukes – empirics dictate defensive posturing

FAS 8, (Federation of American Scientists, Strategic Security, “Nukes in the Taiwan Crisis”

<https://fas.org/blogs/security/2008/05/nukes-in-the-taiwan-crisis/>, 5/13/8, //VZ)

Nuclear weapons also were deployed to Taiwan. As mentioned above, the Matador cruise missile was already present on the island when the Taiwan Strait crisis erupted. The nuclear bombs arrived in January 1960 and stayed for a decade and a half until July 1974. Together with nuclear bombs for tactical fighter wings deployed at Clark Air Base in the Philippines, Kusan Air Base in South Korea and Kadena Air Base on Okinawa, the nuclear bombs in Taiwan probably were intended for use against targets in China and North Korea.

#### Taiwan’s defenses deter China

Michal Thim, a postgraduate research student in the Taiwan Studies Program at the China Policy Institute (CPI), University of Nottingham, an Asia-Pacific Desk Contributing Analyst for Wikistrat, and a Research Fellow at the Prague-based think-tank Association for International Affairs, 09-25-15, Online: “http://thinking-taiwan.com/china-taiwan-military-transformation/”, Article: “China, Taiwan, and the Challenge of Military Transformation” Accessed on: 06-29-16//AWW

In terms of eyes and ears, Taiwan has an extraordinary early warning (and intelligence collection) capability in the form of the new PAVE PAWS radar and it has developed a network of sensors making Taiwan’s maritime domain awareness one of the best in the region. Taiwan’s domestic defense sector provides some of the key capabilities needed for mounting a credible conventional deterrent, and considerable effort has been put into moving some of the most critical infrastructure underground, thus decreasing the PLA’s ability to deliver a devastating first strike. It is perfectly natural that Taiwan’s progress is being judged against that made by the PLA. However, it is also not an entirely fair position to take. Taiwan’s military has been rather busy organization during last two decades, and while many problems plague its armed forces, it also deserves credit for embracing civilian control while striving to absorb all the technological innovations that came along and re-organize itself after several waves of downsizing. The PLA has made some of those changes as well, but it certainly has not had to overcome the hurdles of democratization.

### Fish Turn

#### **Coal plants kill millions of fish annually**

UCS 14 - UCS, Constortium of Scientists (UCS - Union of Concerned Scientists), 2014("How it Works: Water for Coal," published by Union of Concerned Scientists, Available online at http://www.ucsusa.org/clean\_energy/our-energy-choices/energy-and-water-use/water-energy-electricity-coal.html#.V9X-U2grJeU, Accessed 9/11/2016, )

Coal plants, like most other steam-producing electricity-generating plants, typically withdraw and consume water from nearby water bodies, such as lakes, rivers, or oceans, to create steam for turning their turbines.

A typical coal plant with a once-through cooling system withdraws between 70 and 180 billion gallons of water per year and consumes 0.36 to 1.1 billion gallons of that water. A typical coal plant with a wet-recirculating cooling system withdraws only a fraction as much as a once-through-cooled plant, but consumes 1.7 to 4.0 billion gallons per year, while a typical coal plant with a dry-cooled system consumes much less. (See How it Works: Water for Coal for more information.)

When water is drawn into a coal power plant, millions of fish eggs, fish larvae, and juvenile fish may also come along with it. In addition, millions of adult fish may become trapped against the intake structures. Many of these fish are injured or die in the process.

### Econ Turn

#### Dependence on fossil fuels kills Taiwan's economy – price volatility and shipping

Liao & Jhou 13 [Huei-Chu Liao and Sih Ting Jhou , "Taiwan’s Severe Energy Security Challenges," Brookings Institution, 9/12/2013] AZ

Taiwan depends on imports for near 98 percent of its energy consumption, and almost all of that is fossil fuels from turbulent areas such as the Middle East. This creates not only strategic vulnerability, but also economic risks. Energy imports increased from 3.88 percent of Taiwan’s GDP in 2002 to 14.55 percent in 2012. Most people, however, do not feel the severity of the situation as two national own companies control the retail energy price as part of Taiwan’s economy stabilization strategy. The frozen electricity price has induced significant losses for the Taiwan Power Company (Taipower) with NT$1,341 billion (around US$45 billion) accumulated liability at the end of 2012.

This article illustrates Taiwan’s energy security challenges, describes trends in Taiwan’s energy usage and supply, and finally assesses policy solutions that have been proposed by Taiwan’s government.

Taiwan’s current energy practices are, in many ways, unsustainable. The reliance on imported energy, expensive subsidies, high-volume greenhouse gas emissions, lack of advanced technology, and lack of international cooperation combine to create an impending energy crisis for Taiwan.

#### **Lac of econ growth entrenches poverty –turns the case**

Angelsen + Wunder 06 - Arild Angelsen and Sven Wunder Professor of Department of Economics and Resource at University of Massachusetts Boston Bergen, 2006 POVERTY AND INEQUALITY: ECONOMIC GROWTH IS BETTER THAN ITS REPUTAT ION Chapter in Dan Banik (ed.): Poverty, Politics and Development: Interdisciplinary Perspectives. http://www.umb.no/statisk/ior/angelsen\_wunder\_\_poverty\_inequality\_growth.pdf

CONCLUDING REMARKS

We started this chapter by contrasting developmentalist (growth) and class-based (redistribution) views on how to address the problem of poverty. The empirical evidence reviewed provides significant support to the developmentalist view, and while it downplays the relevance of the class-based approach, it does not totally discard it. A strong point in case is that it is hard, empirically, to point to countries where any major poverty alleviation has been achieved without economic growth. Places like Cuba, Sri Lanka or the Indian state of Kerala are exceptional cases where sustained welfare gains have been made through redistribution focused strategies, although more through gains in social indicators than in income. On the contrary, experiences in East and Southeast Asia (Taiwan, South Korea, Thailand, Hong Kong, Singapore, Malaysia, Indonesia) provide ample evidence of the poverty reducing impact of economic growth. The political-economy obstacles of redistribution are much larger if one needs to take away a piece of a stagnant sized cake from the rich, rather than have them accept that they will receive less of whatever increment there is in the cake.

### 2NR – Fossil Fuels Hurt Econ

#### Drags econ development

Liao & Jhou 13 [Huei-Chu Liao and Sih Ting Jhou, "Taiwan’s Severe Energy Security Challenges," Brookings Institution, 9/12/2013] AZ

Relying on imported fossil fuels for 90 percent of its energy mix produces a drag effect on Taiwan’s economic development―particularly in recent years when international fossil energy prices have increased rapidly. Energy imports as a share of total imports increased from 10.28 percent in 2002 to 25.41 percent in 2012, and as noted above increased from about 4 percent of GDP over 14 percent in this same period. The rapid increase of imported energy cost has been partially absorbed by the two state-owned power companies, at significant loss. The debt ratios of Taipower and the Chinese Petroleum Corporation (CPC) were as high as 82.6 percent and 71.9 percent, respectively, at the end of 2012. The accumulated liability in the end of 2012 for CPC was NT$614 billion (around US$20 billion),[1] and for Tai-power was NT$1,341 billion (around US$45 billion).[2] Table 1, below, indicates the growth in liability and debt ratio for CPC and Taipower over the past five years.

### A2 "Yami"

#### Yami is an offensive term rooted in colonialism– reject the aff

CSQ 2 ["A Minority within a Minority: Cultural Survival on Taiwan's Orchid Island," Cultural Survival, 2002] AZ

The two groups have been separated at least since Japan asserted control over Orchid Island not long after it took Taiwan from Manchu China in 1895. The Japanese administration maintained Orchid Island in isolation as a living anthropological museum, leaving the Tao largely undisturbed. Labeled "Yami" by Japanese anthropologists, a name they have rejected in recent years in favor of "Dawu" or "Tao" (which simply mean "people" in their own language), they are the most egalitarian and least stratified of the indigenous peoples of Taiwan, recognizing no chiefs or religious specialists. Traditionally, they wore minimal clothing in their warm island environment, living simply on staples of taro, pigs, and fish, and foraging in the lush forests.

The Filipino Tao were subjected to Spanish and American colonialism and cultural assimilation to Christianity beginning perhaps 300 years ago, but under the Philippine policy of multilingualism they have been allowed to maintain their language. Over the last 100 years the two groups have been only vaguely aware of each other, and only a few missionaries have been able to visit both places. But both areas have oral traditions recalling trade and intermarriage in the past. The renewal of Tao language in Taiwan through communication with their cousins in the Philippines remains a possibility.