

# OF SOLAR PANELS, WINDMILLS AND GEYSERS: DEVELOPING A NATIONAL RENEWABLE ENERGY AGENDA\*

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*"We need to push ourselves to make as many reductions as possible in our own energy use first, and that takes time. But we must do this quickly...the climate will not wait for us."*

*- Rupert Murdoch*

Imagine a world where planes fly around the world on canola oil.<sup>1</sup> Or a city that is void of electrical grids and posts, with each building serving as an energy center that produces its own energy to produce heat, cool, light and power.<sup>2</sup> Imagine a world that is unaffected by fluctuating electricity prices and volatile oil changes, that, at the same time produces clean energy that prevents global warming. A world where sustainable energy is the norm, and development, a standard. Is this science fiction? Or is it a fleeting glimpse of the future?

Ever since scientific data started to show that the human population's ecological footprint has vast and negative effects on the environment, scientists, the media, local organizations and even governments have taken action to ensure that the worsening environmental problems are abated and reversed. The trend of finding and creating renewable energy has become a common concern for most countries and regulatory bodies. As a variety of environmental problems such as acid rains, air pollution, global warming, hazardous waste, ozone depletion, water pollution, overpopulation and rain forest destruction systematically plague

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<sup>1</sup> Seth Masia, *Around the World on Canola Oil*, *Solar Today* (May/June 2008) p. 14

<sup>2</sup> Michigan Alternative and Renewable Energy at <http://www.gsu.edu/marcc/index.cfm?>

not only a specific local community, but the whole world, protecting the only planet that we live in has been a common interest for all nations.

Thus, though a mere ten years back concepts such as using canola oil to power cars seemed preposterous, today they are fast becoming a reality due to the “advancement of science and development of manufacturing methods.”<sup>3</sup> Spurred by the fluctuating oil prices and dwindling fossil fuel supplies, scientists are trying out “completely new and radical techniques that would hopefully solve the environmental issues at hand.”<sup>4</sup> States and research institutions are racing to determine a viable, economic and practical alternative to fossil fuels.

### RENEWABLE ENERGY IS HERE

That nations are now seriously considering what was once dismissed as absurd as feasible and quite practicable illustrates a telling point in our collective experience as dwellers on this planet. Developments like this suggest that we’re nearing “a kind of critical mass in energy technology.”<sup>5</sup> Some observers venture so far as to characterize the present stage of the world environmental situation as the “tipping point”<sup>6</sup>, which explains the tide of research directed towards renewable energy. Correspondingly, developmental reform in favor of sustainable development is fast becoming a norm.

Under the assumption that “the increasing energy consumption and growing world population implies shrinking reserves of fossil fuels,”<sup>7</sup> the “continued dependence on fossil fuels coupled with pressing global issues of climate change has pushed the concept of renewable energy sources to the top of the international agenda.”<sup>8</sup>

According to estimates by the International Energy Agency (IEA), as populations grow and markets expand, to meet the world’s economic growth, world energy needs to grow by fifty-five percent (55%) between 2005-2030. Placed in more concrete terms, this means we need to have

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<sup>3</sup> Brad Collins, *The Tipping Point*, Solar Today (May/June 2008) p. 6

<sup>4</sup> Saumya Gurbari, *Global Warming demands new innovation*, at <http://media.jhnewsletter.com>

<sup>5</sup> Brad Collins, *The Tipping Point*, Solar Today (May/June 2008) p. 6

<sup>6</sup> Id.

<sup>7</sup> Science Daily, *Go Solar, Wind, or Geothermal If you want renewable energy with life-cycle efficiency* at <http://www.sciencedaily.com/releases/2007/07.htm>

<sup>8</sup> Id.

about 17.7 billion tons of oil equivalent (toe) in the available supply, which at present stands at 11.4 billion toe.

With the growing demand for energy consumption especially for Asia, the need to have sufficient energy grows more significant. In the world of globalization, where a shortage in a region or continent affects the whole world, there is a need to ensure that each region should be more self-sufficient, or at least approximate it.

Coupled with the heightening concerns on climate change and its impact, persistently high oil prices and worsening weather conditions, making renewable energy competitive with fossil fuels has been experiencing growing regulatory support. To sustain growth and manage the environmental impact of such demand for energy, there is a need to put into place a system that would enable the market to sustain growth and at the same time enable the environment to be preserved.

#### ADOPTING TO THE TIMES

Renewable energy, refers to an “energy resource that is regenerated over a short time scale and derived directly from the sun (such as thermal, photochemical and photoelectric), indirectly from the sun (such as wind, hydropower and photosynthetic energy stored in biomass), or from other natural movements (such as geothermal and tidal energy) and mechanisms of the environment.”<sup>9</sup>

A short survey of the Asian region easily yields a discernible trend among leading states to promote a regional focus on renewable energy initiatives. Japan, one of the global leaders in energy efficiency and one of the proponents of the Kyoto Protocol, which covers 30% of the total current CO<sub>2</sub> emissions in the world<sup>10</sup>, plans to support developing countries to help them integrate climate change issues in their domestic strategies for development<sup>11</sup>. Japan plans to make good on this objective by allocating funding to the tune of US\$10 billion for five (5) years.<sup>12</sup> China, on the other hand has provided subsidies during the last decade for the construction of small hydropower stations, small wind turbines, solar energy and geothermal appliances in rural areas for solving the problem of energy supply and for

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<sup>9</sup> Renewable Energy at <http://www.trcia.org/mc/page.do?sitePageId=49495>

<sup>10</sup> Nobumitsu Hayashi Report, Regional Cooperation in Clean Development

<sup>11</sup> Nobumitsu Hayashi Report, Regional Cooperation in Clean Development

<sup>12</sup> Nobumitsu Hayashi Report, Regional Cooperation in Clean Development

the avoidance of environmental pollution and ecological degradation.<sup>13</sup> Korea, the tenth-largest energy consumer<sup>14</sup> is planning to introduce an emission trading system that would encourage business to participate in market-based mechanisms that would accredit businesses that voluntarily reduced their carbon emissions.<sup>15</sup> These reforms geared toward increasing renewable energy reliance are remarkable in that they are not confined to domestic concerns, but are meant to trigger effects that are at the very least, regional in scope.

On the Western front, one of the earliest energy policies aimed at increasing the domestic energy supply and addressing energy security concerns was the National Energy Act of 1978 (“NEA”). Of the United States, NEA established a regulatory mandate that encouraged facilities to generate electricity from renewable energy sources embodied in the Public Utility Regulatory Policies Act of 1978. A primary feature of the policy was to foster the development of alternative sources of energy by requiring utilities to buy electricity generated from small power plants using renewable energy sources.<sup>16</sup>

Judging from the favorable attention and commitment it has been receiving, renewable energy has been experiencing remarkable success as a developing field. In 2007 alone, renewable energy has reached US\$71 billion investments in new capacity. Google, one of the biggest search engines on the net plans to invest millions of dollars into the renewable energy business in its desire to “reduce the ecological footprint of the company’s power needs.”<sup>17</sup> Strategies include the hiring of thirty (30) new employees and energy experts to find a way to “significantly reduce the cost of renewable energy generation and bring [it’s] cost on par with coal.”<sup>18</sup>

In Michigan, the Michigan Economic Development Corporation (MEDC) is “aligning scientists, universities, policy makers and industry players to create the next generation of power provision for businesses, consumers and vehicles.”<sup>19</sup> It leads the United States (US) in Research and

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<sup>13</sup> Chen Hongbo, *Regional Cooperation in Clean Development*

<sup>14</sup> Je-Yoon Shin, *Regional Cooperation in Clean Development*

<sup>15</sup> *Id.*

<sup>16</sup> *Energy Information Administration Report, 1996*

<sup>17</sup> David Gutierrez, *Google Pours Massive Investment into Renewable Energy Research* at [http://www.naturalnews.com/renewable\\_energy.html](http://www.naturalnews.com/renewable_energy.html).

<sup>18</sup> *Id.*

<sup>19</sup> *Alternative Energy, Historic agreement will create job; ensure clean, affordable energy for Michigan consumers* at [www.michiganadvantage.org/targeted-initiatives/alternative-energy](http://www.michiganadvantage.org/targeted-initiatives/alternative-energy) on Sept. 18, 2008

Development (R&D) spending per dollar of gross state and trails only California in total expenditures of US\$15.2 billion dollars.<sup>20</sup> Grid-connected solar photovoltaic was the fastest growing technology in the world with an estimated 7.7 gigawatts or some 1.5 homes with rooftops solar PV feeding into the grid. Biomass and geothermal energy were widely used for power and heating.<sup>21</sup>

In terms of nationwide policy, newly elected US President Barack Obama's promise to spend \$150 billion over the next 10 years developing alternative energy leaves a legacy for future generations to imitate. Reduction of carbon levels, a cushion against fluctuating oil prices and creation of more jobs in economic slowdown would be the natural offshoots of this policy. Already, clean technology and green energy stocks have registered a new high as US analysts anticipate a major boost from their president. And there is good reason for this. The strokes of Obama's policy<sup>22</sup> augur new opportunities for everyone: ensuring 10 percent of domestic electricity comes from renewable sources by 2012, and 25 percent by 2025; creating a New \$7,000 Tax Credit for purchasing advanced vehicles; and establishing a National Low Carbon Fuel Standard.

### DOMESTIC INITIATIVES HAVE TAKEN ROOT

As renewable energy enjoys worldwide growth, the Philippine Renewable Energy Sector has also made astounding leaps to make the country self-sustaining considering that it is an archipelago composed of 7,100 islands, with poor infrastructure and a highly centralized energy production that focuses only on urban areas. With a good portion of provinces experiencing limited electricity, renewable energy can help decentralize power generation, lessen dependence, and make each province self-sustaining and accountable for contributing to the country's economy. By severing the tie of dependency between a remote region and more urbanized centers where at present most energy resources are located, regional development can proceed at a more steady, non-intermittent pace,

The Philippines targets a sixty percent (60%) energy self-sufficiency by 2010 in a bid to become more energy independent, with President Gloria

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<sup>20</sup> Wind Energy, Historic agreement will create job; ensure clean, affordable energy for Michigan consumers at [www.michiganadvantage.org/targeted-initiatives/alternative-energy-on-Oct-18,2008](http://www.michiganadvantage.org/targeted-initiatives/alternative-energy-on-Oct-18,2008)

<sup>21</sup> PGMA seeks speedy congressional action on Renewable Energy Bill at [www.gov.ph](http://www.gov.ph) news – not necessary – act has been passed technically just awaiting for PGMA to sign the bill

<sup>22</sup> See White House post at [http://www.whitehouse.gov/agenda/energy\\_and\\_environment/](http://www.whitehouse.gov/agenda/energy_and_environment/)

Arroyo stating that there is a need to “further cut [the country’s] reliance on oil.”

As of 2007, self-sufficiency level improved to 57.20% from the 45% level in 2000. In the power generation sector, self-sufficiency level has reached 66% in 2006 as dependence on oil went down to 8.21% from 20.28%.

Under the Renewable Energy Policy Framework adopted in 2003, the Philippines aims to redouble renewable energy capacity in 10 years. As of end 2007, renewable energy capacity stood at 5,455 megawatts (MW). This plan indicates additional capacity requirements of 5,393 MW for the period 2009-2012. A part of the additional capacity requirements would be provided by the first wind farm in Southeast Asia located in Bangui, Ilocos Norte that is currently operational.

Geothermal power now accounts for about 28% of the electricity generated in the Philippines,<sup>23</sup> with the Leyte field being “one of nature’s most perfectly designed geothermal resources”<sup>24</sup> contributing to such energy output. One aptly described the province of Leyte as “very blessed in the sense that resource is not common to any other part of the world.”<sup>25</sup>

Should the altruistic reasons be not enough, there are good economic reasons in choosing to adopt these strategies. A study done by the World Wildlife Fund and the University of the Philippines National Engineering Center showed that the country can save as much as \$2.9 billion from avoided importation of fossil fuel by merely increasing the country’s renewable energy share in its power generation mix from 0.16% to 41%. Today, 26% of the country’s power comes from burning imported coal, whilst 23% comes from burning oil. Last year the country imported 101.4 million barrels of oil, costing \$7.5 billion. An analysis by the Renewable Energy Coalition showed renewable energy sources can reduce the country’s oil imports by half. These savings are powerful tools. They can be used for social and infrastructure programs, which at this time of global economic turmoil are our best bets to hedge against disaster.

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<sup>23</sup> Blaine Harden, *Filipinos Draw Power from Buried Heat*, *Washington Post Foreign Service*, at <http://washingtonpost.com/wp-dyn/content/article/2008/10/03>

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

### DEVELOPING RENEWABLE ENERGY AS AN INVESTMENT INCENTIVE

The remarkable growth of renewable energy-focused initiatives within the country can be attributed to the government's conscious effort to attract renewable energy investments by legislating measures<sup>26</sup> and courting investors that make the Philippines a conducive environment for entities exploring renewable energy initiatives. It is significant to note that our policymakers have recognized that there is a significant opportunity to reduce pollutants and greenhouse gas (GHG) emissions by replacing fossil energy with renewable energy and bioproducts derived from agriculture.

Among investors that agreed to invest in the Philippines are the Bionor Transformacion of Spain and Abengoa also of Spain.<sup>27</sup> With Bionor looking for 100,000 hectares in Palawan for its jatropha nursery and Abengoa some 60,000 hectares for a cassava bioethanol nursery.<sup>28</sup>

A landmark for domestic alternative energy policy is the Renewable Energy Act<sup>29</sup> that was signed into law by President Gloria Macapagal Arroyo on 16 December 2008. The law's framework emanates from the initiatives I developed in Senate Bill No. 2046. As author and sponsor, I have long advocated the adoption of these policies and reforms, even carrying the campaign with me in international fora, such as the Asia Pacific Finance and Development Center Biennial Forum in Shanghai, China where I spoke last October 2008. The Act seeks to speed up market development for renewable energy by providing for appropriate incentives and policies that would make renewable energy as a mainstream source of energy. The law implements this by providing the legal and institutional framework necessary for harmonizing policies on the swift development of renewable energy technologies. It is quite rewarding to see this rationale for the renewable energy agenda, which I announced a year ago<sup>30</sup>, finally coalesce into a law hailed for its exceptional possibilities. In her interviews, the President said the new legislation is the "first and most comprehensive renewable energy law in Southeast Asia" that will enable the Philippines to capture a part of

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<sup>26</sup> E.O. 232/462 – The Ocean, Solar and Wind Law; PD 1441, An act to promote the exploration and development of geothermal resources; RA no. 7156 on Mini-Hydro; RA no. 9337 – Reformed VAT law and E.O. 226 of the Board of Investments Incentive

<sup>27</sup> *Supra* note 24.

<sup>28</sup> *Id.*

<sup>29</sup> Senate Bill No. 2046 and House Bill No. 4193

<sup>30</sup> [http://www.senate.gov.ph/press\\_release/2008/0225\\_angara1.asp](http://www.senate.gov.ph/press_release/2008/0225_angara1.asp)

the soaring investments in renewable energy development worldwide – an emerging market whose value was pegged at \$71 billion last year.

Essentially, the bill seeks to implement a three (3) pronged approach that the nation should embark on: 1. capitalizing on the newly created “emissions trading” scheme under the Kyoto protocol; 2. developing a national policy imposing a “mandatory renewable energies” target; and 3. creating a national demand side management strategy for the country to reduce energy consumption and fossil fuel dependency.

Among its features is the Renewable Portfolio Standard<sup>31</sup>, which is a means to ensure that use of renewable energy is integrated into the market’s consciousness. Through this, the government can require energy suppliers to source a minimum percentage of their annual energy demand from renewable energy-based sources.<sup>32</sup> This simply means that electricity to be sold by a supplier must be procured from a renewable energy source. Thus, investments on renewable energy are ensured of being able to get back their cost of capital and at the same time increase the consciousness of users that the energy that they use come from clean, recyclable and environment-friendly methods. The requirement also mandates developing and implementing a preparedness program that would inform, educate and prepare all stockholders in the industry, thus encouraging more businesses that operate on renewable energy. These provisions mirror successful initiatives that have been tested abroad. In the United States for example, over twenty (20) states have Renewable Energy Portfolio Standards that require utilities to generate a certain percentage of their power from renewable energy sources. The most aggressive state in promoting renewable fuels is Minnesota, which has consumption mandates for ethanol and biodiesel.<sup>33</sup>

A similar approach is used in the United States Congress response to the energy crisis by enacting the Energy Policy Act of 2005, which is aimed at increasing and diversifying domestic energy production. It includes key provisions to help diversify domestic energy production through the development of renewable fuels. The energy Policy Act mandates a renewable fuel phase-in called the

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<sup>31</sup> Senate Bill No. 2046, Sec. 5

<sup>32</sup> Id.

<sup>33</sup> North Carolina Solar Center. (2005). *Database of state incentives for renewable energy*. A project of the North Carolina Solar Center and the Interstate Renewable Energy Council. <http://www.dsircusa.org>

renewable fuels standard (RFS), requiring U.S. fuel production to include a minimum amount of renewable fuel each year, starting at 4 billion gallons in 2006 and reaching 7.5 billion gallons in 2012. Another significant feature is that after 2012, renewable fuel production must grow at least the same rate as gasoline production.

The Renewable Energy Act also allows for a Green Energy Option that gives end-users freedom of choice to choose renewable energy as their source of energy.<sup>34</sup> More importantly, it provides for a feed-in-tariff mechanism that sets a fixed price for electricity sourced from renewable energy for 12 years.<sup>35</sup> Income tax holiday for 7 years, duty-free importation for Renewable Energy equipment and materials, tax credit on Domestic Capital Equipment and Services, and tax exemptions of carbon credits generated from renewable energy sources.<sup>36</sup> A 10% corporate income tax, as against the regular 30%, is also provided once the income tax holiday expires. The road to energy self-sufficiency to 60% by 2010 (from 56.6% in 2005) is also paved by encouraging resources like solar, wind, hydropower, ocean and biomass energy; renewable energy facilities, which are given a 1.5% realty tax cap on original cost of equipment and facilities to produce renewable energy.

The law also prioritizes the purchase, grid connection and transmission of electricity generated by companies from renewable energy sources and power generated from renewable energy sources will be value added tax-exempt.

These incentive-centered features are particularly important. Much of the success that corn ethanol enjoys as a fuel alternative can be attributed to United States government's incentive programs starting in the 1970s. For example, the Energy Tax Act of 1978 instituted a motor fuel excise tax exemption giving ethanol blends at least 10% by volume a \$0.40/gallon exemption on the Federal motor fuels tax. While in 1980, the Energy Security Act offered insured loans to small ethanol plants that produced less than one million gallons per year. These incentives were supplemented by the Crude Oil Windfall Tax Act, which extended the ethanol motor fuel excise tax exemption. It also provided "fuel blenders" the option of receiving the same tax benefit by using an income tax credit instead of the

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<sup>34</sup> Senate Bill No. 2046, Sec. 7

<sup>35</sup> Senate Bill No. 2046 Sec. 13

<sup>36</sup> *Id.*

fuel tax exemption. These tax credits had a major impact on the emerging biodiesel industry. Largely due to the gains spurred by tax credits, biodiesel production in the United States increased from about 25 million gallons in 2004 to over 90 million gallons in 2005. According to the U.S. National Biodiesel Board, there are currently 53 plants producing biodiesel in the United States, with another 40 plants expected to come online soon. Production tax credits have also been used to encourage electricity generated by qualified energy resources, including biomass, and some animal wastes.<sup>37</sup>

This in effect ensures that a demand is created as a management strategy for the country to reduce energy consumption and fossil fuel dependency by providing profitability and business incentives to investors and businesses that use or produce renewable energy. With a fixed price for electricity costs and tax credits for renewable energy investments, businesses are encouraged to resort to renewable energy, which according to reports, may lead to nearly US\$5 billion savings on oil import bills by 2014.<sup>38</sup>

In order to ensure that all Filipinos experience the benefits of renewable energy, the far flung areas of the Philippines are given priority under the approved Renewable Energy bill. It provides for cash incentives for Renewable Energy developers undertaking missionary electrification.<sup>39</sup>

As cited by Moody's, "longer-term solutions, based on providing incentives to innovate and conserve energy are needed to transition Asian economies from their dependence on oil."<sup>40</sup> The passing of such a law is the Philippine's step towards sustainable growth and clean development. It is a long-term solution to put a dent on the reliance on fossil fuels that are imported and expensive compared to renewable energy.

### REFINING A NATIONAL RENEWABLE ENERGY AGENDA

Adapting a renewable energy agenda is not easy, nor is it foolproof. Even in the short history marking it from its inception, there have been indicators as to how renewable energy, just like any other policy, can be misapplied. Our renewable market will boom even more as cost efficiency

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<sup>37</sup> Gielecki, M., Mayes, F., & Prete, L. (2001). *Incentives, mandates, and government programs for promoting renewable energy*. U.S. Department of Energy, Energy Information Administration. [http://www.eia.doe.gov/cneaf/solar.renewables/reca\\_issues/incnt.html](http://www.eia.doe.gov/cneaf/solar.renewables/reca_issues/incnt.html)

<sup>38</sup> Business World Online, Renewable Energy Bill Ratified Vol. XXII, No. 54.

<sup>39</sup> Senate Bill No. 2046, Sec. 10

<sup>40</sup> Moody's International Report (2008)

attains parity with other competing energy sources. In order to help this along, a few policy considerations must be taken into account.

In order for renewable energy not to turn into a case study of the unintended consequences of well-intentioned government intervention in the marketplace, due care must be taken in considering the extent to which governments are willing to make their investments into “infant technologies” or “green corporations” who seek to ride the green wave. A stringent regulatory policy must be put in place to make sure that those who seek to take advantage of the incentives provided by a renewable energy policy are truly capable of delivering the promises they make.

Regarding intent versus result, there is also a need to create a central, unbiased, and consumer-friendly source of information about renewable energy choices. Market forces, with their inherent way of ensuring either the demise or viability of any enterprise, must be allowed to work into the renewable energy agenda. The proliferation of alternative sources of fuel and/or energy is not the be-all and end-all of the solution to the problem. In the range of fuels alone we have alternatives drawing on coconut, corn, used cooking oil, and even water. Clearly, the greater concern lies in choosing which alternative energy/fuel source to support or push under the national agenda. In this context, determining what will be eventually included in the government’s renewable energy resource plan must be a process that encapsulates market preferences as well as policy considerations. The chance that market verdicts change cannot be a rationale for government to pick “winners” and “losers” before the market does. The market process is the best way to allocate scarce resources amid uncertainty. After all, no amount of pushing will sustain an energy program that the market does not deem acceptable or economically feasible.

It is thus incumbent upon the primary governmental actors to scrutinize applications and deny funding for speculative proposals that have little chance to advance commercialization. This prudence can prevent the government from spending hundreds of millions in ultimately non-viable renewable energy initiatives that were created simply to take advantage of government subsidies. As a measure of implementing this safeguard, I incorporated a provision in the Renewable Energy Act creating a Renewable Energy Research Institute under the Department of Science and Technology, with a budget of 100 million pesos for 2009.

The solution is not to solely and heedlessly throw millions at uneconomic technology that will do little to achieve fuel diversity, export

commercialization, clean air and other goals any more than before. Rather, it will only exacerbate a public policy failure. Government efforts must consider that consumer demand and technology can make what is uneconomic today economic in the future. If central station power from wind, solar or other renewable energy sources become economic on their own merits, there will be no complaint from free market quarters. In fact, free market advocates will likely be defending these resources from zero-tolerance environmentalists who will condemn even air-emission-free energy for its other environmental costs.

Inability to act and to act now undermines the many advances we have made in many decades. It is failing the next generation, plundering them of the future that we so enjoyed and should have passed in to them as an inheritance long after we are gone. The challenge, is to ensure that such changes happen not tomorrow, not in our children or grandchildren's time, but now.

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