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An Analysis of Fossil-Fuel Dependence in the United States with Implications for Community Social Work

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Abstract

This article examines fossil-fuel dependence in the United States with emphasis on the areas of transportation and food. It is argued that fossil-fuel dependence will cause significant social and economic problems in the future and that ongoing usage is a major contributor to mounting environmental degradation. Ultimately, the authors argue that our fossil-fuel based economy is unsustainable and that efforts should be taken to reduce usage and dependence. A growing community movement aimed at revitalizing local economies and reducing fossil-fuel usage has recently emerged. Social work can bring critically important values and knowledge to these and similar efforts, especially in regard to community organizing and the participation of marginalized populations.

Key Words: Fossil Fuels, Energy, Sustainability, Local Economy, Community Organizing, Social Work

Introduction

This paper explores United States' dependence on fossil fuels, the precarious state of these energy sources, and the implications of their continued use for community social work. It will be argued that continued fossil-fuel usage constitutes a serious threat to society and the earth and that local communities should work toward reducing dependence and consumption. More specifically, social workers can bring much needed values and knowledge to local communities working toward these goals.

Fossil-Fuel Dependence

During the 18th and 19th centuries, coal was the primary energy source used in the nascent industrial revolution. Although this fossil fuel is still widely used for electrical

generation, during the 20th century petroleum and natural gas emerged as principle fuels for transportation, heating, agriculture and manufacturing (Energy Information Administration [EIA], 2007). Currently, petroleum and natural gas are also used as basic materials for plastics, fertilizers, many chemicals, and a wide variety of commodities including clothing, carpeting, computers, cosmetics, paint and other building materials (EIA, 2008a). In virtually every material aspect, life in the United States is now dependent on these fossil fuels.

Transportation illustrates the depth and scope of this dependence. The energy density, transportability and low cost of gasoline, diesel and jet fuel – all petroleum derived – enabled the expansion of national roadways and the economic centralization and globalization of the post-WWII era (Worldwatch Institute [WI], 2008). During this time, consumers became increasingly dependent on goods transported thousands of miles (United States Department of Transportation, Federal Highway Administration, 2007), and communities experienced an erosion of local manufacturing capacity and agriculture for local consumption (Pfeiffer, 2006; Working for America, 2008). This economic expansion and related dependency “. . . is almost exclusively based on cheap fossil fuels” (WI, p. 26).

Personal transportation also became highly dependent on petroleum during the post-WWII era. The pedestrian neighborhoods of previous generations were supplanted by a suburban infrastructure requiring the automobile for virtually every aspect of life outside the home (Kunstler, 1993). Concurrently, the transportation of goods and passengers by rail was replaced by an elaborate interstate highway system (Lewis, 1997; Weingroff, 2006). This system is highly dependent on petroleum for fueling commercial and personal vehicles and in its construction and maintenance (EIA, 2007). The movement of goods and people is now heavily reliant on fossil fuels with 96% of all transportation utilizing petroleum (International Energy Agency [IEA], 2005).

Similarly, the current food system is dependent on the extensive use of fossil fuels for production, processing and transportation. Farming practices utilize machinery requiring petroleum-based fuels, common pesticides are derived from petroleum, and many fertilizers are made from natural gas (Pfeiffer, 2006; Polack, Wood & Bradley, 2008). On average, current food production requires 10 units of fossil-fuel-derived energy for every unit of food produced (Giampietro & Pimentel, 1993). Moreover, as with manufactured goods, food is now commonly transported long distances through production, processing, and distribution (Pirog & Benjamin, 2003; Pirog, Van Pelt, Enshayan & Cook, 2001). Food, one of the most essential elements of a viable community, is now highly fossil-fuel dependent.

Other examples of dependence include home heating which is overwhelmingly reliant on fossil fuels, including the use of heating oil, natural gas and electricity (EIA, 2007). Note here that electrical generation, an essential aspect of the modern infrastructure, is 49% coal derived with natural gas and petroleum comprising another 23% (EIA, 2008b).

A little understood but critically important aspect of fossil-fuel dependence is the energy used in energy production. Increasing energy is now required for the discovery, extraction, processing and transportation of petroleum and other energy sources. For example, during the 1930s the energy equivalent of approximately one barrel of oil was used to obtain 100 barrels of

petroleum; by 2006, however, the ratio had been reduced to approximately 1 to 15, a trend that is expected to continue. As the ratio of an energy source nears one to one, the energy becomes inaccessible, in spite of remaining reserves (Hall, Powers & Schoenberg, 2008). Moreover, even renewable energies such as solar and wind are dependent on fossil fuels in the manufacturing and transporting of related equipment (Schneider, 2008). As with transportation, agriculture, and virtually every aspect of modern life, the production of energy itself is highly dependent on fossil fuels.

In almost every material aspect, including consumer goods, food, transportation, heating, and the procurement of energy itself, life in the United States is heavily dependent on fossil fuels, especially petroleum. What is the state of these energy sources and what are the ramifications of their continued usage?

The Fossil Fuels in Crisis

During the first half of the 20th century, massive petroleum reserves were discovered in the United States. Domestic production, however, peaked during the early 1970s (Campbell, 2002; United States Government Accountability Office [USGAO], 2007). In spite of new technologies and Alaska's Prudhoe Bay, one of the world's largest fields, production has declined steadily during subsequent decades (National Petroleum Council [NPC], 2007).

Throughout the recent decades of declining production, domestic demand for petroleum increased steadily in correlation with economic growth (Tertzakian, 2006). The ever-widening gap between declining domestic supply and increasing demand was filled by imports. By 2006, the US, with 5% of the world's population, was consuming 24% of the global supply or 21 million barrels daily (British Petroleum, 2008), with approximately 60% of that quantity imported. Today, the US remains critically dependent upon imports (EIA, 2008c).

Similar to domestic U.S. production, a growing number of experts believe that aggregate, global petroleum production is now peaking or will soon peak and enter irreversible decline (Bentley, Mannan & Wheeler, 2007; Berge, 2008; Deffeyes, 2005). Among the many factors suggesting an imminent global production peak is the ratio of consumption to the discovery of new fields. Since the 1980s, and accelerating in recent years, world consumption has dramatically outpaced discovery, with about four barrels consumed for every barrel discovered during 2002 (Campbell, 2002). Moreover, production is now declining in two thirds of oil-producing countries (Bentley et al., 2007). Whenever it occurs, the inevitable decline in global production will likely produce volatile and rising prices and increasing scarcity.

Global-production decline is, however, only one threat to imports. The US is highly reliant on numerous oil-exporting countries that are hostile toward it, politically unstable, or already in production decline. Examples include Venezuela, where President Chavez, has repeatedly threatened to eliminate exports to the US (Romero, 2008); Saudi Arabia, a nation in extreme social tension and potential political unrest; Nigeria, where production facilities are regularly attacked as part of local political conflicts (Klare, 2004); Mexico, home of the world's second-largest field which recently entered irreversible decline (Clemente, 2008); and Iraq, a country

with a tenuous government and significant social unrest. Of the major exporters to the US, only Canada is stable, friendly, and capable of consistent production (EIA, 2008c; EIA, 2009).

Moreover, some analysts have cited petroleum as a major factor driving international policy and geopolitical conflict. This is especially the case in regard to the Middle East, the location of approximately two thirds of the world's remaining reserves (Klare, 2004). Given its import dependence, geopolitical tensions are likely to continue as the US attempts to influence governments or directly control dwindling supplies in various parts of the world. Such tensions are expected to contribute to upward price pressure in the future (NPC, 2007).

Numerous alternative energies, including wind and solar, coal liquefaction, unconventional petroleum, nuclear and others, may be employed to mitigate inadequate petroleum supplies. Currently, however, all alternatives involve problems contributing to significant uncertainty about U.S. energy supplies (Deffeyes, 2005; Energy Watch Group, 2007; USGAO, 2007). A recent NPC (2007) report summarized: "Many complex challenges could keep these diverse energy resources from becoming the sufficient, reliable, and economic energy supplies upon which people depend. . . ." (p.1). Concurring with this assessment, a study commissioned by the United States Department of Energy concluded that a 20-year lead time would be required to mitigate a projected downturn in supply without "significant economic hardship" (Hirsch, Bezdek, & Wendling, 2005, p. 65).

Similarly, drilling currently restricted areas, including the Arctic National Wildlife Refuge (ANWAR) and various offshore sites is not expected to compensate for future supply inadequacies. Analysts have concluded, "there is ample evidence that the U. S. is in terminal decline and opening all remaining land and waters to oil development would at best only slow the inevitable" (Blanchard, 2008, p. 1). In any case, petroleum is ultimately a nonrenewable resource. Pursuing exploitation of protected areas is, at best, a short-term response to addressing supply problems (Berge, 2008).

Coal and natural gas share many common characteristics with petroleum. Although domestic supplies of coal are significant, a recent study by the Energy Watch Group (2007) concluded that at higher levels of projected usage, global coal production will move into decline in a matter of decades. What were once abundant reserves of the clean-burning, high-energy variety of coal are now nearly gone in the US (Energy Watch Group, 2007).

Domestic natural gas production in the US may also be at, or near, its peak. Additionally, natural gas is difficult to transport long distances, with the current infrastructure insufficient for increased usage (Hirsch et al., 2005). As with all fossil fuels, natural gas reserves are inherently finite and will be exhausted under continued exploitation.

In addition to being non-renewable, fossil fuels frequently engender environmental damage through their production and use, including habitat loss, water pollution, soil erosion and other deleterious effects (National Research Council, 2003). Salient among these effects are the linkages between fossil-fuel usage and climate change (IEA, 2008; WI, 2008). The use of petroleum-based products, especially coal, has been cited as a key factor in growing CO₂ levels and anthropogenic climate change (NPC, 2007). Although inadequate supplies of fossil fuels constitute an immediate threat to the U.S. economy, the long-term effects of climate change may

eclipse all other issues in social and economic impact (Flannery, 2005). This issue is, in itself, a compelling reason for dramatically reducing and ultimately eliminating fossil-fuel usage.

To summarize, fossil-fuel usage is a central, pivotal factor which threatens society and planetary well being. The IEA (2008), arguably the most trusted energy watch group in the world, recently concluded that “Current global trends in energy supply and consumption are patently unsustainable – environmentally, economically, [and] socially” and “the future of human prosperity depends on how successfully we tackle the . . . energy challenges facing us today” (p.37). The situation in the United States is especially acute with import dependence further contributing to the likelihood of inadequate supplies. Alternative energies and increased domestic drilling are unlikely to fully mitigate future supply inadequacies. Moreover, fossil-fuel usage engenders significant environmental damage, especially in regard to climate change. In short, continued fossil-fuel usage constitutes a central and growing threat to society, the earth and future generations.

Social work authors have noted many issues related to fossil-fuel usage, often making connections to social issues and social work values. For example, Gamble and Hoff (2005) have explored resource depletion, climate change, and their social consequences. Among other concerns, van Wormer, Besthorn and Keefe (2007) have pointed out the difficulty of maintaining professional commitments in a context of rising fuel costs. Mary (2008) has adumbrated various aspects of fossil-fuel dependency, including peak oil, geopolitical conflict, and climate change. Additionally, National Association of Social Workers (NASW, 2000) policy recommendations have included advocacy “for fossil-fuel elimination or reduction to be replaced, where feasible, with clean energy such as solar, wind, and water” (p.106). Building on these foundations, the severity of current factors justifies social workers elevating fossil-fuel reduction to a high degree of importance at every level of practice. This paper will now explore several broad implications for community practice.

Community, Economy and Sustainability

Fossil-fuel usage is closely related to the problem of economic and social sustainability. The exploitation of fossil fuels, especially as used in modern transportation systems, is an essential factor in the emergence of our current, highly centralized and globalized economy (WI, 2008). Petroleum-derived fuels, in particular, have enabled an unprecedented movement of commodities over increasing distances during the course of resource extraction, manufacturing, and end consumption. Analysts have noted that this fossil-fuel-dependent economic system is inherently unsustainable and also highly vulnerable given the nonrenewable nature of its foundational energy source (Heinberg, 2004; Rubin, 2009).

A response to the unsustainable nature of the global economy includes the revitalization of local economies or *relocalization* has been identified as a key factor in sustainable social and economic development (Community Solutions, 2009; McKibben, 2007; Transition United States, 2009). As the current economic system evolved during the post-WWII period, local communities were systematically stripped of manufacturing capacity, food production for local consumption, and other aspects of their economies. Although some parts of the centralized, global economy may eventually prove sustainable through the use of renewable energies, achieving significant

reductions in fossil-fuel usage requires that much economic activity now return to the regional and especially local levels. The rebuilding of local economies, especially in regard to productive capacity, is both a prudent and rational strategy for reducing fossil-fuel dependency and working toward sustainability (Community Solutions, 2009; Transition United States, 2009).

Predictably, a community-based movement aimed, in large part, at local economic revitalization has emerged during the last decade (Post Carbon Institute, 2009; Transition United States, 2009; Willits Economic Localization, 2009). An important focus of this movement is the strengthening of productive capacity for essential commodities including food and renewable energy. Generally, community-based, relocalization organizations also strive to reduce fossil fuel usage in transportation, building practices, infrastructure planning and other areas. Broader efforts may also encompass revitalizing neighborhoods, promoting local culture, creating jobs, establishing local currencies, and strengthening community interdependence in many diverse areas.

These community efforts to reduce fossil-fuel usage illustrate several points of importance for community social workers. Firstly, the relocalization of economic activity can reduce fossil-fuel usage while strengthening communities. When a community disengages from the material, global economy, there is generally a reduction of fossil fuels used in the transport of commodities; but more than just this, strengthening local economies may also enhance self-sufficiency, interdependence, and security at the community level (Community Solutions, 2009; Transition United States, 2009).

Secondly, as numerous groups are now demonstrating (Community Solutions, 2009; Transition United States, 2009), the revitalization of local economies is best achieved through locally based organizing, including assessment, planning, and the coordination of efforts at the community level. In other words, fossil-fuel reduction and economic relocalization are a natural fit for community social work.

Finally, as communities work toward relocalization, the broad goal of reducing fossil fuel usage may encompass numerous, diverse initiatives related to food production, transportation, housing, renewable energy, and other areas (Post Carbon Institute, 2009; Transition United States, 2009; Willits Economic Localization, 2009). The ubiquity and depth of our current dependence makes fossil-fuel reduction a common denominator for many areas of community concern and intervention.

Taken together, the closely related goals of revitalizing local economies and reducing fossil-fuel usage constitute a powerful orientation for community social workers; but what can social workers bring to such community efforts?

The Social Work Contribution

Social work literature has reflected a growing recognition of the connection between sustainability and local community development. Gamble and Hoff (2005) have cited bioregionalism as a community development orientation (see also Sale, 2000). This model

emphasizes social and economic adaptation to regional geological factors, including climate and other conditions. Mary (2008) has recommended social work participation in sustainable development at the global, national, and also local levels. Other social workers (Jacobson, 2007; Polack et al, 2008) have advocated for the revitalization of local food systems. Similarly, Coates (2003a), recognizing the vulnerability of the current economic system, has noted that “local communities may increasingly become responsible for ensuring that the needs of . . . people are met” and also that “participation and cooperation become critical for sustainability as local resources are developed and controlled by local people to meet local needs” (p. 120).

Social work can bring much needed values and knowledge to communities working toward the reduction of fossil-fuel usage. Historically, social work practice is rooted in well articulated values including the dignity and worth of the person, social justice, and the importance of human relationships (NASW, 2010). These seminal values have been expanded to include additional concepts, principles and formulations relevant to environmental issues and sustainable development. Hoff and Polack (1993) have identified Native American spirituality, feminism and ecological thinking as alternatives to the dominant cultural values of materialism and growth. Mary (2008) has suggested identity and harmony with the earth, nature wisdom, equality, and partnership (as opposed to a cultural attitude of domination) as alternatives for social workers. Coates (2003b) and Coates and Leahy (2006) have identified a requisite shift in beliefs, values, and cultural assumptions for working on sustainability. These include subjectivity, recognition of oneness, the intrinsic value of the earth, and a sense of conscious responsibility to the earth. Similarly, Besthorn (2003) has expanded social work’s “person and environment” formulation to encompass a deeper connection with and responsibility toward the natural world. Finally, several authors (Coates, 2003a; Berger & Kelly, 1993; Mary, 2008) have cited a necessary shift in attitude toward “stewardship” and away from domination in regard to the earth and natural resources. In both its historical, core values and expanded formulations, social work provides a rich and evolving orientation which can inform community efforts in economic development and fossil-fuel reduction.

In particular, community-based efforts to reduce fossil-fuel usage provide a powerful opportunity for the realization of social justice. As local communities come together to address energy issues, social workers can emphasize grassroots participation, equality in decision making, and the empowerment of all community members, including historically marginalized populations. As Gamble and Hoff (2005) have noted, social workers “can bring diverse, often excluded, voices to the planning table” (p.178).

In such efforts, social workers may draw on numerous community practice models which comprise a part of the knowledge base of the profession. Many of these models emphasize effecting social and economic justice through community organizing. For instance, Rothman’s (2008) well established Community Capacity Development model is based in the view that “change is best accomplished when the people affected by problems are empowered with the knowledge and skills needed to understand their problems, and then work cooperatively together to overcome them” (p.142). This model of community organizing emphasizes “participatory planning” and local capacity building, especially in regard to marginalized populations. Similarly, in regard to community development and environmental issues, Gamble and Hoff (2005) have suggested a practice orientation emphasizing democratic and participatory planning,

capacity building, and inclusiveness, with emphasis on the participation of women and girls among others.

Finn and Jacobson's (2003a) practice model is a "justice oriented approach" which makes strong, explicit connections between the value of social justice and practice. The Just Practice Framework (Finn and Jacobson 2003b) makes "power, inequality, and transformational qualities the foci of concern" (p. 69). The model utilizes five key concepts: meaning, context, power, history and possibility and "their interconnections as a guide for critical reflection and action" (Jacobson, 2007, p. 42). Ultimately, the Just Practice Framework is a process-oriented practice model which may be used to foster participation and empowerment in community building. It encompasses assessment, advocacy, policy work, and a wide variety of other foci, making it highly applicable to communities working on the broad goals of economic revitalization and fossil-fuel reduction (Finn & Jacobson, 2003a).

Social workers can bring well developed and evolving values to local communities organizing toward the reduction of fossil-fuel usage. Of particular importance are social justice, and the participation and empowerment of marginalized populations. Moreover, the social work knowledge base includes a variety of empowerment-based practice models which can be utilized by communities working on the issues.

Strategies

Local communities working toward economic relocation and the reduction of fossil-fuel usage may draw on a broad range of existing efforts. A few are included here to illustrate the scope of strategies, programs and initiatives currently being pursued by local communities and community organizations.

Co-op Power "is a regional network of local communities creating a multi-class, multi-racial movement for a sustainable and just energy future" (Co-op Power, 2008, para. 1). Some of the organization's projects have focused on developing solar, wind and biofuel production, while creating significant employment opportunities. Co-op Power maintains grassroots control and offers electricity at a reduced rate for low-income households.

Similar to energy co-ops, Community Choice Aggregation is a legal mechanism whereby end-users "combine purchasing power into a single block", which may influence utility companies to use locally-based, renewable sources of electricity (Community Choice Energy Alliance San Francisco, 2007, para. 1). This strategy uses market forces to empower end-users while increasing the economic viability of locally generated, renewable energies.

There are many examples of communities working toward the revitalization of local economies in the area of food, including a growing local food movement (Community Food Security Coalition, 2008; Polack et al., 2008). For example, Just Food, a New York City nonprofit, is focused on creating a "just and sustainable food system in the New York City region" (Just Food, 2008, para. 1). Their efforts have supported local farmers and provided affordable, healthy produce for low-income residents. Strategies have included the development

of community gardens and educational programs including conferences, workshops and demonstrations (Just Food, 2008).

Community-based strategies for reducing fossil-fuel consumption related to transportation have been equally creative. Car sharing is gaining popularity in many communities including St. Louis, San Francisco, and others. Typically, members pay a fee which provides access to a shared pool of automobiles (Car Sharing Network, 2008). An emerging variation on car sharing, Avego, is described as “a cross between carpooling, public transport, and ebay (Avego Shared Transport, 2008, para. 2). A central computer system connects drivers to riders with the goal of reducing wasted seat capacity. Also, many communities are promoting the use of bicycles through infrastructure changes and related programs. For instance, following the lead of many European cities, Washington, D.C. has developed a bike sharing program. A minimal annual fee provides access to bicycles at kiosks throughout the city (Clear Channel Outdoor, 2008).

There are numerous grassroots organizations employing more complex strategies aimed at energy reduction and local economic development. Sustainable South Bronx was founded in 2001 “to advance the environmental and economic rebirth of the South Bronx” (Sustainable South Bronx, 2008, para. 2). Projects have focused on energy, water, and transportation – including a recent 30 million dollar bike and pedestrian path. Their “Green Roofs Project” utilizes extensive roof plantings to lower summer temperatures and reduce energy used for cooling. The organization has maintained a strong community empowerment and social justice focus from its inception. For example, as an aspect of their energy reduction projects, “green collar” job training has provided education and placement for many residents on public assistance or with prison records. The organization also advocates for just-energy policies including the reduction of pollution in low-income neighbourhoods (Sustainable South Bronx, 2008).

Strategies have also included infrastructure planning and housing. New urbanism, a school of architecture and community planning developed in response to the suburban model, is aimed at “Giving people choices for living an urban lifestyle in sustainable, convenient and enjoyable places, while providing the solutions to peak oil, global warming, and climate change” (New Urbanism, 2008, para. 1). Aspects include neighborhoods with daily activities accessible by foot, mixed use zoning, and increased public transportation. Similarly, cohousing involves residents sharing some living space and other aspects of daily life (Cohousing Association of the United States, 2008). Common utilities, kitchens, laundry facilities, and food preparation typically reduce energy consumption and cost, while promoting closer communities. As one of many examples, families in the Westwood CoHousing Community in Asheville, NC share a solar collector and central heating used in their common house (Westwood CoHousing Community, n.d.).

Summary

During the 20th century the United States became highly dependent on fossil fuels in virtually every aspect of its economy. The supply of these nonrenewable energy sources is increasingly in jeopardy. Their continued use is also contributing to significant environmental problems. It is imperative that communities revitalize local economies and reduce fossil-fuel

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usage. Social workers can bring important values and knowledge to communities working toward these goals.

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