



The Race for What's Left: The Global Scramble for the World's Last Resources

Public Affairs Program

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Introduction

JOANNE MYERS: Good morning. I'm Joanne Myers, and on behalf of the Carnegie Council it is my pleasure to welcome back Michael Klare and C-SPAN Book TV to our Public Affairs Program.

Some of you will remember that Michael has appeared at this podium a few times before [for links to his previous talks, [click here](#)]. Each time he has spoken here, he has raised our awareness about the dwindling supply of natural resources. Today is no exception, as he discusses [The Race for What's Left: The Global Scramble for the World's Last Resources](#), in which he takes us one step further in alerting us to a new era of acceleration, where unsustainable resource needs may prevent us from meeting ever-increasing demand.

While most of us take it for granted that we will always have water to drink, gasoline to fill up our tanks, and food on the table, Professor Klare argues that these cornerstones of our existence may soon slip away, especially as populations grow and needs multiply. Where once we lived in a world of vast deposits of oil, copper, gold, natural gas, and other key minerals to fulfill the needs of an industrialized world, he posits that today we are looking at a situation where reserves are being depleted at a terrifying pace.

Our guest writes about the sudden emergence of rapacious new consumers, the devastating effects of climate change, the technical and environmental limitations on the exploitation of new reserves, and the questionable methods required for acquiring these resources.

He also talks about what happens when governments are presented with an unprecedented shortage of resources and what they may be driven to do in order to gain control over the remains of the world's raw material base, wherever it can be found, at whatever the cost.

In writing about these issues, Professor Klare brings to our attention questionable methods required for acquiring these resources, as illustrated by the competitive race for oil and gas deposits taking place in Arctic waters, or offshore drilling, which can result in environmental risks, as we recently saw with the [BP oil spill](#) in the Gulf of Mexico.

In addition, he describes with fascinating detail the land-buying sprees by countries, such as China and Saudi Arabia, who lack farmable land of their own and are therefore spending vast amounts of money to acquire farm plots in other countries for their own use, often at the expense of the supplying country.

These examples are among but a few of what is to come and the issues that lie ahead.

With each appearance here at the Carnegie Council, Professor Klare has always presented a well-thought-out and meticulously documented argument. This morning he admonishes us to see this as not an aggressive race for what's left, but a race to adapt, and the only way out is to alter our consumption patterns altogether. To do otherwise would be catastrophic, as much-needed resources will completely disappear.

To gain a better understanding of where we stand now and the choices we need to make, please join me in giving a very warm welcome to our guest.

Michael Klare, thank you for joining us once again.

Remarks

MICHAEL KLARE: Thank you.

Well, hello everyone. Good morning. I'm just totally thrilled to be here again. I've always enjoyed coming to the Carnegie Council, and I want to thank Joanne Myers for inviting me again. It's a great treat to be here with all of you this morning, and I look forward more than anything to the feedback and the questions and comments we'll have afterwards. I have to get through my speech first to come to the good part, which is the discussion that we'll have.

Let me jump into my presentation on my new book, *The Race for What's Left*.

The gist of my presentation is that we are at a pivotal moment, a turning point, in the history of the human species. At this moment, I believe, more humans enjoy greater wealth, consume more resources—food, water, minerals, oil, gas, coal, and so on—than ever before in history. This extraordinary abundance has been made possible because humans have brought to bear increasingly sophisticated technology to search the world for sources of the vital materials we need to produce all of this wealth and abundance.

As a result, at this moment virtually the entire planet is integrated into a global system of resource extraction, production, processing, and distribution. This is a remarkable achievement and makes it possible for us and billions of people around the world to enjoy an exceptionally high standard of living, higher than any other humans have ever experienced.

But all of this, modern industrial civilization writ large, is now at significant risk. The great danger before us to this is resource depletion.

Because we humans have been consuming the world's natural resources at such a frantic pace for so long, many, if not most, of the primary resource reservoirs on which we depend—oil fields, natural gas fields, coal mines, copper and iron mines, forests and fisheries, and so on—are largely exhausted or are rapidly being depleted at such a rapid pace that they too will soon be depleted.

Let me just give you one example of what I am talking about. In 2009, the International Energy Agency, the IEA, which is an arm of the Organization for Economic Cooperation and Development, conducted a survey, the first ever systematic survey, of all of the major oil fields then in production, the 800 major oil fields, which supply the vast majority of the oil on which we depend.

In 2009, those oil fields, our main source of energy, were producing 68 million barrels a day out of the 80 million barrels a day or so that we consume. But these fields are being depleted at such a rapid rate, the IEA found, that they predicted that by 2035, 75 percent of the productivity of those fields would vanish and those same 800 fields would be producing only about 18 million barrels a day, a loss of 50 million barrels a day, most of the world's oil supply.

Now, let's be very clear. If that oil is not replaced, the petroleum age will be over, our global transportation systems will collapse, and the world's economy will be in ruins.

Fortunately, says the IEA, we will find new oil to replace all that's lost. But they also make it very clear that this new oil will not be the same kind, of the same nature, as that which has been lost. It will not be the easy oil that we've relied on up until now—that is, oil derived from reservoirs that are close to the surface or close to shore, that are easily processed into usable fluids, and acquired from hospitable climates.

Rather, the new oil, if we find it, will be of a tough variety—that's my word, tough oil—that is derived from deep under ground in small pockets; or far offshore in inhospitable climates, like the Arctic; and in forms that are costly and difficult to process, like [Canadian tar sands](#), Venezuelan [extra-heavy crude](#), [oil shale](#), and [shale oil](#).

There is a lot of those materials. I'm not saying there isn't. There are vast amounts of these unconventional forms of petroleum. But obtaining them will be costly, difficult, and dangerous, and many may prove too costly and dangerous to produce.

This, in essence, is the story of all the vital resources on which we have come to rely. Most primary sources of supply are in decline, or soon will be so, and the remaining sources for the most part are less desirable due to their location (in the far north, far offshore) or their inferior quality (low-grade ores) or trapped in unyielding geological formations.

Again, these materials are not necessarily disappearing, but the remaining supplies are less prolific than those they replace, and they are located in difficult areas and may not be able to meet human ends for very much longer.

I also worry about global supplies of farmland that we need to produce the food we humans will rely on. Most of the world's arable land, rain-fed land, is now in production, the supply of water that can be used to irrigate land is limited, the population is growing, and it is very unclear where the additional farmland is going to come from to meet future human needs.

We are at a pivotal moment in the history of the human species. What we see unfolding before us is what I call "the race for what's left, a global struggle and scramble for the world's last resources."

This contest will have many powerful consequences, which I believe will shape our lives and shape the course of future human history and so deserve close attention. What I see is an epic struggle emerging between the world's major industrial powers and the world's major resource corporations for control over what remains of the world's primary resources.

And because most of the planet has already been thoroughly explored and all likely resource reservoirs have been brought into production, this race is unfolding in those few areas that have escaped exploitation in the past, because they have been out of reach (like the far north and the deep oceans) or trapped in unyielding geological formations (like shale gas) or located in war zones or inaccessible territories (like Iraq, Mongolia, Afghanistan, and the Democratic Republic of the Congo).

If you read the business journals and the trade journals, like *Oil & Gas Journal*, you will know that these are the areas where all the action is taking place, the places where the major resource corporations are deploying their money, their technology, and their political clout.

This summer, for example, as the ice sheet melts and temperatures rise, we will see the busiest drilling season ever in the far north, with new projects coming underway in the Beaufort and Chuckchi seas, the waters of the Arctic that abut Alaska; and waters off of Greenland; and in the Bering Sea above northern Norway. We are also going to see an accelerated pace of drilling in the deepwater Gulf of Mexico, in offshore Brazil, and in offshore West Africa. Particularly, we are going to see increased efforts to extract the [pre-salt oil](#), the oil below the salt dome under the Atlantic Ocean off of Brazil.

Mining is also accelerating in these marginal areas, in the far north, in Siberia, Afghanistan, the Congo, and Mongolia.

Now, resource extraction operations like this have always produced problems throughout human history. These are invasive activities, they are costly, they do produce a lot of wealth, and, inevitably, they lead to friction and conflict, environmental damage, invasions of indigenous people's lands, corruption, violence, and so on. This is par for the course, given the invasive nature of these activities and the great wealth they can generate.

But the race for what's left will see an intensification of all of these hazards, because the competition among producers will be greater than ever before because so little is left, and the environmental risks will be exponentially greater because the areas are that much more vulnerable to the destructive capacity of these technologies.

The competition will be greater because more people in more nations and more corporations will be seeking control over a diminishing pool of available resource reservoirs, and only those countries and only those corporations that prevail in this struggle can be expected to survive the struggle, and those that fail to do so will be devoured by the others. So they are going to fight much more ferociously than ever before. These struggles will take a financial form as well as military forms.

To give an example of what I mean, Joanne alluded to the BP disaster in the Gulf of Mexico. When the leak was still underway two years ago in the Gulf of Mexico and it became very obvious that BP was going to face massive claims and penalties because of the environmental damage and the loss to the livelihoods of people in the region, other companies began circling around and planning takeover of BP. Exxon/Mobil and Royal Dutch Shell both considered a hostile takeover of BP.

In the end, BP was able to survive these takeover attempts, but it was forced to sell off at a loss tens of billions of dollars of its prime assets in order to raise the \$20 billion for an escrow account that President [Obama](#) required them to establish. It was only by a narrow margin that BP was able to stay in business.

These kinds of takeovers, hostile takeovers and the devouring of companies, we can expect much more of that. In my book I talk about mining companies that, one by one, those that have acquired claims of useful minerals are being devoured by bigger and bigger firms.

This is only one aspect of this race for what's left. But I fear even more the violent dimensions of this struggle. With fewer resources and greater demands, I believe we could expect intensified struggles for contested territories and contested claims.

An example of this would be the growing struggles in the East and South China Seas between China and its neighbors, clashes which have sometimes resulted in armed violence and the loss of lives.

These clashes arise over contested undersea deposits of oil and natural gas. Both the East China Sea and the South China Sea are believed to harbor very large reserves of oil and natural gas, but they lie in waters of overlapping claims between China on one hand, Japan on the other, in the East China Sea; in the South China

Sea, the Philippines, Vietnam, Malaysia, Brunei, and Indonesia.

In pursuing its claims, China has deployed its navy. It has clashed with vessels belonging to the other countries. This has led to naval violence and clashes at sea and the loss of lives.

I worry that these kinds of clashes at sea will intensify and lead some day to a far more dangerous event, in which an initial episode escalates into something far more dangerous, including full-scale war. And, because the United States is allied with Japan, with the Philippines, and with other countries in the region, there is a strong risk of U.S. involvement in any such clash.

If you have been following developments in Washington, you will know that President Obama and Secretary of State [Hillary Clinton](#) have said that with the war in [Iraq](#) and [Afghanistan](#) over, the center of gravity of American military policy from now on is going to be the South China Sea, and it is going to involve U.S. naval power deployed in the area to support the countries that have clashed with China over these disputed territories. So this is becoming, in my view, the most dangerous area in the world with respect to the possibility of U.S.-China conflict.

I also worry that similar clashes will occur in other disputed maritime areas, like the Caspian Sea and the Arctic, and even the area around the Falkland Islands, which nobody paid much attention to since the last [war](#). But now that the UK is drilling in the contested areas of the Falklands, tensions with Argentina have [heated up](#) again, and the British have deployed more military forces there and the Argentines have become much more antagonistic.

But conflict and competition are only part of the dangers that arise from the race for what's left. Another major consequence will be increased environmental damage. This is an inevitable consequence of this contest.

Because so many of the world's remaining resource reservoirs are located in marginal ecological areas, we are going to see increased drilling and mining in areas that are especially vulnerable to spills and toxic wastes, like the Arctic, Siberia, Alaska, tropical forests, and the deep oceans.

Any spills in the Arctic, for example, will pose a severe threat to the survival of species that are already at risk, like polar bears and walrus, seals, and many species of whales, and it is going to be much harder to mount a rescue operation and a cleanup operation in the Arctic than in the Gulf of Mexico.

When the BP event occurred, it was possible for BP to deploy hundreds of ships and other service vessels to contain the spill and to minimize the environmental damage. When Shell goes up this summer and starts drilling off of Alaska, any similar incident will be virtually impossible to contain because there is no capacity in the region to deal with this kind of disaster—or if it occurs off of Greenland or in the Bering Sea.

Likewise, drilling and mining in northern Scandinavia and Siberia pose a threat to the cultures of the indigenous peoples who live there. This is true wherever you look.

Another case for worry is the most massive mining project now being planned in the United States, the [Pebble project](#), a multi-billion-dollar gold and copper mine in the Bristol Bay area of Alaska, which poses a severe threat to the survival of the world's most important salmon fisheries, along with the livelihood and culture of the native peoples of Alaska. This is just about to come before the government for approval or not. It would be a catastrophic project if it goes ahead.

These are just a few examples of what is a global pattern of intrusive extraction in fragile wilderness areas producing a high level of environmental risk.

I want to highlight the particular risk that arises from the use of advanced technology to extract oil and gas from unyielding rock formations, or to convert undesirable petroleum supplies, like tar sands and extra-heavy crude, into usable liquids.

With all the easy oil gone, and the easy natural gas, the only way for the oil companies to maintain production, as I said earlier, is to attack these leftover, unconventional sources of energy. This involves going after the large shale formations that we have in the United States, in Canada; there are some in Europe, in Argentina, and China. To extract these resources, though, you can't drill; you have to smash the rock and fracture it to release the oil and gas.

The technology used for this is [hydraulic fracturing](#), or fracking, which requires the injection of millions of gallons of chemically laced water under very high pressure to smash the rock and create fissures that allow the oil and gas to escape. This is an effective technology, but it requires the use of all this water, which becomes contaminated with toxic chemicals and cannot be returned to the natural environment for fear of poisoning the water supply of neighboring communities.

So it has to be processed somehow or stored underground. That has resulted on occasion in earthquakes, as [recently found in Ohio](#). Any leakage of this wastewater into underground streams and aquifers could threaten the

safety of a city's water supply, including potentially New York's water supply.

Similar risks arise from deepwater drilling, as we're well aware, and from the production of Canadian tar sands, which also involves the use of large amounts of water which subsequently become infused with toxic substances and pose a danger to the environment.

All of these risks are bound to multiply as we become more reliant on the world's remaining resource preserves, most of which will entail environmental hazards of one sort or another.

These will, however, satisfy our resource needs for a while. For a short term, at least, exploitation of these final resource reserves will meet our needs. But eventually they too will be depleted, and then there will be nothing left on the planet to meet our resource needs.

We are looking at the last chapter, I believe, in the long arc of human history, which began when humans first left Africa in search of new lands for hunting and gathering many hundreds of thousands of years ago.

We face a period of transition, a turning point, in which we have to think about what the future faces for the human species. We have to think about what kind of world we might face, what our descendants, our children and grandchildren, will face, when this chapter ends.

I see two possible paths we can proceed down.

The path that we are headed on, which requires or assumes ever-increasing resource consumption to meet our needs, is one that will lead, I believe, to a world of increasing scarcity in which some people might enjoy at least some of their needs and the vast majority of the population is living with just the bare necessities, and those that have even some of their needs will be fighting constantly amongst themselves for whatever few supplies of resources remain.

In this scenario, much of the planet will be uninhabitable due to climate change or the damage caused by reckless resource extraction. This, I fear, is the world that we are headed towards if we continue to consume natural resources in an unsustainable manner, without thought for the future of the planet.

But I can envision an alternative future, one in which we humans use resources in a different way, in a conservative, frugal fashion: recycling as much as we can and using everything else in the most efficient and practical manner possible, and for those resources which are not replaceable we will develop alternatives from substances that we can grow easily or that are very plentiful, and we will rely on renewables like the sun and wind to meet our energy needs.

Such a world, I believe, will favor communities living in large towns and cities and older, denser suburbs where public transit is available and public services can be provided at maximum efficiency and minimum cost. These communities will be constructed of super-efficient materials and rely on renewable sources of heat and power.

Now, I know that not everybody is going to favor that sort of life. There are people who still will want to live in a rural area with lots of open space, although doing so will become increasingly difficult in a world of diminished resources.

But I sense that most people, especially the young people that I meet, my students, prefer to live in an urban setting, where there are jobs, cultural options, cafes, restaurants, and other social opportunities, and other young people to socialize with. So this vision of a green, resource-efficient urban future will, I believe, prove increasingly appealing to more and more people.

It will also, I believe, increasingly become the norm around much of the world. We see this already in places like London and Paris and Barcelona and many German and Japanese cities, where energy and other resources are used much more efficiently than they are in the United States and people are much more aware of the risks of resource scarcity and climate change.

Now, I'm aware that people in this country are largely in denial about resource scarcity and climate change, although they know in their hearts, I believe, that this is coming. But no amount of lecturing on my part will convince them to change their outlook.

But most Americans are also worried about jobs and the economy, and it will soon be obvious that while we are engaged in a costly and hazardous race for what's left of the planet's scarce resources, much of the rest of the world is engaging in a race to adapt, a race to master the new technologies that will make reliance on costly and dwindling finite materials irrelevant.

As time goes on, therefore, we risk—those of us in this country who continue to persist in the older model, the other path—we risk falling behind, as other countries, like China, Japan, and Germany, take the lead in developing the new green resource-efficient technologies, generating new jobs in their countries, while eliminating

them here in this country.

I know that young people, students, are painfully aware of this predicament and are totally determined to engage in the development of the innovative new systems and technologies that will allow us to succeed in the race to adapt. My students at Hampshire College and the other colleges I teach in, what they seek to do in their life is to design green cities and green spaces and green technology. This is their great hope, so that they will have both a job and a future and something they can look forward to. They want to make positive changes.

And so I have come to believe that the most important thing we can do today, people of my generation, is to support all those who are engaged in these efforts so that when the race for what's left is over we will be left, not with a depleted, exhausted, blighted world of massive poverty and despair, but with a world of light, culture, community, innovation, and hope. It's with that message that I'd like to finish.

Thank you.

Questions and Answers

QUESTION: Susan Gittelson.

Thank you for your very carefully researched presentation and for ending on a positive note. But let me ask you about things you didn't have a chance to mention.

On the geopolitical level, China is everywhere looking for resources. How do you feel about the conflict and competition in Africa, for example in Nigeria, and so forth?

Also, you mentioned Brazil. Brazil is in a better position to take control over its resources than many other countries would be.

The other area you didn't mention is nuclear energy as an alternative.

MICHAEL KLARE: I'll start with the first.

From my reading of both the science and the economic dimensions, nuclear energy will never be more than a niche response to our future—until, that is, scientists develop a new means of using nuclear power than the current one. The fission technology, which is now 40-50 years old, has proven not to be cost-effective. But it could be that future nuclear technologies now being developed in another generation or two will eliminate the problem of wastes and safety problems, and therefore will be much more cost-effective for utilities to build.

But the utilities are turning away those that operate under a capitalist system. China, which you alluded to; India, where the market forces don't prevail, where the government can decide, "We're going to build a nuclear reactor," may build them. But not market economies. It is cheaper to build other kinds of sources of energy.

China: I could have said more in my presentation, but I'm alluding to these global struggles, and China is a very big part of it, obviously. State-owned corporations—Sinopec, CNPC, CINOPEC—competing with Western companies for control over Africa, Central Asia, now Latin America, and it is going to be very vicious. They can use their government support for the companies.

I did talk about the South China Sea and the East China Sea, where Chinese companies are very aggressively pursuing access to those resources.

Brazil: The problem that Brazil finds is that the extraction of energy from these pre-salt fields, so called, will be more complicated than any energy project ever attempted by humans. You're talking about two miles of water, two miles below that of salt, sand, rock, mud before you hit the oil. The sand and the mud and the salt are constantly shifting, so you have to have a well that goes four miles down through shifting layers without leaks coming in that would come up and either leak into the water or explode.

So far they have not been able to do this. It will cost them hundreds of billions of dollars. They need Western technology. I think they are playing with absolute fire. Yesterday it was revealed that one of the earliest of these wells, run by Chevron, is [leaking again](#).

So I say the race for what's left is going to lead to increasingly more hazardous conditions.

QUESTION: I'm Paul Seger, the Swiss ambassador to the United Nations.

Thanks a lot. I agree with the previous speaker that it has been a very inspiring lecture you have given us.

In June, we will have the [Rio+20 conference](#) coming up. Actually, this week there is a preparatory meeting. So what would be your message to the participants of the Rio+20 conference?

We are talking about the green economy, which is very divisive. The north is rather in favor of it. The south says it's another green conditionality which impedes development. What would be your message to the conference to change?

MICHAL KLARE: The more I think about it, the more I focus on cities, because two-thirds of the human population, including the vast majority of people in the developing world, are going to live in cities in the future. That is where the emissions are going to be, where the energy is going to be required. So I would say let's focus on cities, how can we provide them with the energy they need in a cost-effective green way with a minimal use of resources and collaborate on that, rather than try to tackle everything.

It's the city problem that will be the mammoth challenge. If you put it that way, that's something in which we—you know, here in New York City it's a problem. In the north and in the south it's a shared problem that I think can be jointly explored.

QUESTION: Professor Klare, what do you see realistically as the role for alternative energy—wind, solar, atomic power? It seems that the [administration](#) came in very strongly for alternative energy, and it seems to me that there's some pushback. It's terribly expensive. There are environmental problems with windmills, things like that. I've read that only maybe 10 percent can be picked up by these alternative energies.

What do you honestly see as the stopgap between the internal combustion engine and alternative energy? We seem to be in a difficult position right now.

MICHAEL KLARE: I think trying to push for subsidizing green energy is a very tough sell right now. I think it is easier to push for conservation of energy and efficiency. Accelerating the pace of the fuel efficiency standards might be an easier way to achieve some of the same things that we need; that is, require that cars be much more fuel-efficient and release less emissions.

This is the tack that California is taking, for example—and California is the biggest auto market in the country, and also sets the stage for what a lot of other states are doing.

So I think efficiency promoting, any incentives you can give to get people to give up their clunkers for hybrids and electric cars through the tax system—I think that of course continued research on innovation is important, but not necessarily what happened with [Solyndra](#), where you try to invest in these companies. Let market forces prevail.

You know, a lot of the way that the decisions are made are through tax breaks, hidden subsidies to the oil companies that you have to be a tax accountant to figure out. If those could be shifted to advantage the renewables, that would go a long way to speeding that up, without appearing like you're giving them right-out, flat-out subsidies.

QUESTION: I read a book called *Control Resources of the World*, written by Juan Williams Noel [phonetic]. This man was alluding to the fact that natural resources are like human beings: they were born, they grow, and they die. That means natural resources are a continuum as long as human beings live. Now, the essence of his book is in contradiction with what you are saying, that natural resources continue to diminish. How can you identify this contradiction?

MICHAL KLARE: I don't know what you are referring to. Of course, humans have always had a capacity for innovation, and that is how I ended my presentation, that we do have this capacity to innovate and move in a new direction.

But the history of human archeology tells us that humans originated in northeast Africa, and were game hunters and gatherers. As the resource capacity of their original habitat was exhausted, humans migrated. They migrated first to Europe and the Middle East, then to Asia, and then to South East Asia, China, Siberia, and eventually to the New World, in pursuit of new lands to exploit. This has been the history of humans.

There are no more lands to exploit—unless you believe the fantasies of [Newt Gingrich](#) that we're going to go to the moon, and I don't believe that. So we have to realize there is nowhere else to go. We have the one planet we have. There are no more places to exploit. So from now on our innovation has to be in the direction of efficiency, conservation of resources, recycling, and the development of renewables. I hope that crosses the contradiction you mentioned.

QUESTION: Ron Berenbeim.

Two questions. Number one, you haven't said anything about water.

Number two, with the focus on cities, which makes a lot of sense with respect to energy efficiency, in light of the [Arab Spring](#), what would you anticipate in terms of political turbulence as a result of heavy concentration of people, particularly young people, in cities?

MICHAEL KLARE: Thank you. I actually did refer to water once. I talked about future food scarcity and land scarcity and the problem that most of the land that's now rain-fed is in use, and I worry about the future availability of water for irrigation because of climate change. So water is a very big concern, absolutely.

Providing water to cities is going to become an especially big concern. I worry about the struggle we are going to have in this country, the United States of America, between those who want to use water to produce energy supplies through this very risky procedure of hydraulic fracturing, which is going to need massive quantities of water, and the drinking needs of the population and the farming needs of the population.

By the way, producing corn ethanol is the most greedy form of water use in this country right now. So we have to decide where our priorities lie, number one.

The second question you asked me about cities—and that's why I believe, and I said to our friend from Switzerland, in the importance of addressing cities. If two-thirds of the world's population lives in cities and most of them are not provided with basic necessities—water, electricity, transportation, and jobs—those cities are all going to be explosive tinderboxes, as we have seen. So providing the needs of urban populations around the world, including in North America, will be among the most difficult tasks facing policymakers and leaders in the decades ahead.

That is already a problem, a massive problem, because that's where the youth come, where they are exposed to political influences, some of which can be radical and extremist, and where crime thrives, and where the differences between the rich and the poor become magnified, leading to explosive upheavals. So we had better attend to the needs of the billions of poor people living in cities.

QUESTION: I'm John Richardson.

We've had oil for a little more than 100 years. Obama talks about alternate energy, green energy, and stuff. That's a great research project, and money should be spent on it. But it's not real for the moment.

You haven't talked about gas. I understand we have lots of natural gas. We have this new [shale gas](#). It's here. We don't need to import it. It technically works. You've got buses that run on gas, trucks could run on gas.

What's the problem? People say, "Oh, there's not enough distribution." You can build gas pumps not selling gasoline but selling gas. You can work on hydrogen fuel cells. What about that whole expanse of technology which is there and works?

MICHAEL KLARE: Yes. I did talk a lot about gas. I talked about hydro-fracking for the gas reserves in North America, the [Marcellus Formation](#). The problem with it is that it is going to destroy the northeast to get at it. The shale gas is trapped in rock.

So yes, there is a lot of it, there's no question there is a lot of it, although much less than they are saying. In the most recent report from the Energy Information Administration, they have lowered by 60 percent their estimates of North American shale gas, just so you know.

But, even so, to get at it—we're not talking about a giant reservoir that you stick one drill in and up comes the gas. You're talking about rock formations. You have to have a drill every half-a-mile over thousands, tens of thousands, of square miles. So all of Pennsylvania is now going to be covered with these drills, invading the entire countryside.

And, if they have their way, New York state is next. Two-thirds of New York state is targeted for this invasive procedure—I mean every half-a-mile. And the water supply of New York City is at risk in this process.

So don't think that we are going to get this gas easily and without risk.

Now, you say it can be used. It certainly can be used to generate electricity, and that is better than the coal we might use. But as for converting that into a liquid for cars, I don't see it happening anytime soon.

QUESTION: Robert James. I'm a businessman here, 60 years in oil and some mining.

I think you're very good at finding problems, not quite so good at solutions. There have been a lot of solutions.

We've been fracking for 60 years. You've got a million people in Fort Worth. All of them have wells there that are fracked. Nothing has happened, no problems.

MICHAEL KLARE: That's not true.

QUESTIONER: Well, I know a lot about it because I drill there, and nobody is suing me. So I don't think that's a problem. But maybe you know something about this.

MICHAEL KLARE: There have been earthquakes triggered, seismic events, attributed to fracking.

QUESTIONER: In Ohio?

MICHAEL KLARE: In Fort Worth.

QUESTIONER: Well, you say that easy oil is gone. How do you define "easy oil"? Brains make hard oil easy. Have you seen this?

MICHAEL KLARE: Easy oil costs a dollar a barrel to produce. That's a good definition of easy oil. The stuff in Canada or deep offshore costs \$60, \$70, \$80, \$90, \$100 a barrel to produce. I'd say that's a big difference.

QUESTIONER: Well, I would say you are wrong.

QUESTION: Laurence Meltzer.

The [last time you were here](#), you predicted war between the United States and China, some small wars and then maybe large wars, over this issue. How do you feel now and could you elaborate on that scenario?

MICHAEL KLARE: I think the situation has deteriorated. I didn't say that it was inevitable. I said that the United States and China are engaged in a competitive struggle in which they get involved in proxy conflicts that have the potential to escalate. I think that that situation has gotten worse since I was here last.

I think that the policy adopted by the Obama administration in the past few months, beginning with President Obama's [speech](#) in Canberra on November 17, and now with the new defense policy [announced](#) on January 5 by President Obama, which says that the center of gravity of U.S. defense policy will be the South China Sea, that it will revolve around contesting China's efforts to dominate that area, says that we are going to see a lot more confrontational sorts of activity in that whole region. So I think that's a sign of worry.

I think that there have also been increasing efforts by China to dominate Central Asia, and that is also going to produce stress.

I'll tell you, though, what I worry about most, and it's deeply distressing to me, is that, as the result of various decisions made by the United States and its allies—not necessarily for bad reasons—like the intervention in [Libya](#), has led to a closer alliance between China and Russia. This is involving not just political collaboration, but arms sales, energy deals, and a growing resistance to the United States on issues like Iran and [Syria](#), and a kind of hardening of the international environment, which I think is deeply distressing.

QUESTION: Richard Valcourt.

The consumption of resources is usually done by people. How do you feel about population control?

MICHAEL KLARE: My answer to that—you'll forgive me—is to say that the population that we have to worry about most in the short term is of cars. The population of cars is expected to double over the next 25 years. That is the biggest threat to the resource consumption that I worry about in the short term, because that will vastly increase the pressure on oil supplies, particularly from China, because China's oil consumption is expected to double over the next 25 years, and its import requirements will triple because they need to import all of that extra oil.

That is going to lead to—the person who asked me about competition between the United States and China in Africa, because a lot of that is going to come from Africa. So there will be more tension there. I worry about that.

But the human population, that's where the food issue arises and why the issue of land grabs that I write about is so upsetting, where countries like Saudi Arabia are buying farms in Ethiopia to fly food from Ethiopia, which is not exactly a place where people have full stomachs all the time, to Saudi Arabia.

I worry about growing population. Do I know how to solve that? I do not. The best answer is to build health clinics for women in poor countries and provide contraceptives and reproductive health benefits. That is not going to be easy to sell. But that's the proven answer, the only proven answer.

QUESTION: Sondra Stein.

I wanted to mention I was surprised to read that Japan is planning to come out with cars using hydrogen, I think by 2020. I thought that was technology that was much further in the future. Assuming that is so, how will that affect pollution, energy sources?

MICHAEL KLARE: There are buses around—I saw them in New York or Washington—that are powered by hydrogen. But this is still a long way from being a full-scale commercial technology.

Hydrogen is a very plentiful substance, but it doesn't occur naturally. You can't mine it. You have to get it from something else. Water has a lot of hydrogen in it, H₂O, but to get that you could use electrolysis. You need energy for that.

So where are they getting the hydrogen? From the grid. In this country that is produced by coal more than anything else. So producing hydrogen is not helping with emissions, it's worsening the problem, until we find a way to produce hydrogen without increasing emissions. That is going to require solar power and wind power or nuclear power, some other way of producing hydrogen than coal and oil and natural gas. Until we do that, it's not going to help with emissions.

Another problem with hydrogen is it needs a catalyst, especially in smaller vehicles like cars. The catalyst of choice is platinum, and platinum is a very scarce material, and it only is found in a few countries, a lot of it in South Africa and Zimbabwe. In those places the production is leading to a lot of conflict and a lot of violence. There have been [strikes](#), many of them violent, in Zimbabwe and South Africa right now. [Robert Mugabe](#) is trying to take control of those platinum mines for his cronies to finance his dictatorship. So the platinum for the hydrogen is very problematic as well.

QUESTION: Ulrike Klopfer.

It seems to me, but I'm somewhat ignorant, that solar power would be the cleanest power—maybe wind also, but the windmills you know are a problem. Why is that not being developed and used more?

MICHAEL KLARE: The problem with solar power is twofold.

One, the sun isn't out at night, so we need a way to store the sun power during the day so that it's available at night, and that technology is still imperfect. So we have to develop much more efficient batteries or other storage systems so that during the daytime you can produce electricity or heat and keep it overnight to produce electricity.

There is a lot of research going on in that. People have found that you can heat liquid salt and it retains its heat and you could use that at night to generate electricity, for example. But it is still imperfect.

The other problem with solar power is that the strongest sources of it are in the desert, and there are no electric transmission lines there. So we have to build a new transmission grid to bright, sunny places to carry that.

If you turned uninhabited desert areas of the American Southwest into giant solar arrays, you could power most of North America with that. But first you have to invest in the transmission lines to carry it to where it's needed, and the storage. But I believe that day will come.

JOANNE MYERS: I want to thank you for energizing the discussion and for being so generous with your answers.

MICHAEL KLARE: Thank you.

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