

ENVIRONMENTAL QUALITY COUNCIL  
MAY 6, 2010  
EXHIBIT 4

F O R E S T R Y

EQUIPMENT



JOHN DEERE

Forestry Systems



JOHN DEERE

End-to-end solutions.  
For a job that never ends.

## Whatever it takes.

You have one of the toughest jobs in the world. Which is why John Deere builds a complete line of top-quality, versatile and rugged forestry equipment that gets the job done with roaring productivity, end to end.

The way we look at it, productivity is not just about how many hours you spend on the job. It's about how much work you get out of every one of those hours. With our full-line forestry solutions, you get more productivity per hour and lower operating costs from high-quality equipment that simply refuses to quit.

When you talk, we listen. And then we apply innovative thinking to solving your problems. These innovations show up everywhere from simple machine design improvements to entire new machine forms like our Energy Wood Harvester, to smart electronics that put more control and real-time communications into your cab.

It all comes down to making a tough job just that much easier. And making you more productive and more profitable, end to end, start to finish.

ROAD BUILDING



HARVESTING / PROCESSING



EXTRACTING



# Reach the forest. Harvest



DOZERS



MOTOR GRADERS



EXCAVATORS

## ROAD BUILDING

Crawler Dozers  
16,500-78,000 lb (7,500-35,000 kg)

Motor Graders  
145-245 net hp (108-205 kW)

Excavators  
4,173-185,876 lb (1,893-84,312 kg)

Swing Machine Road Builders  
164-271 hp (122-202 kW)

Skid Steers  
5,150-9,160 lb (2,338-4,159 kg)

the forest. Deliver the forest. Re



WHEELED  
FELLER BUNCHERS

TRACKED  
FELLER BUNCHERS

WHEELED HARVESTERS

TRACKED HARVESTERS

## HARVESTING

Wheeled Feller Bunchers  
174-225 SAE gross hp (130 kW-168 kW)

Tracked Feller Bunchers  
241-294 hp (180-219 kW)

Wheeled Harvesters  
182-255 hp (136-190 kW)

Tracked Harvesters  
181-294 hp (135-219 kW)

Swing Machine Harvesters/  
Processors  
164-271 hp (122-202 kW)

Harvesting/Processing Heads  
Maximum delimiting up to 34.6 in (88 cm)

new the forest. End-to-end prod



SKIDDERS

FORWARDERS

LOG LOADERS

MILL YARD LOADERS

## EXTRACTION, LOADING AND MILL

### Skidders

129-200 SAE gross hp (95-151 kW)

### Forwarders

183-195 hp (136-145 kW)

### Track or Stroke Delimbers

164-182 hp (122-136 kW)

### Tracked Log Loaders

164-271 hp (122-202 kW)

### Knuckleboom Log Loaders

170 hp (127 kW)

### Wheel Loaders

59-380 net hp (44-283 kW)

activity from John Deere.



ENERGY WOOD  
HARVESTERS

COMPACT TRACK LOADERS  
SKID STEERS

DOZERS

## REFORESTATION

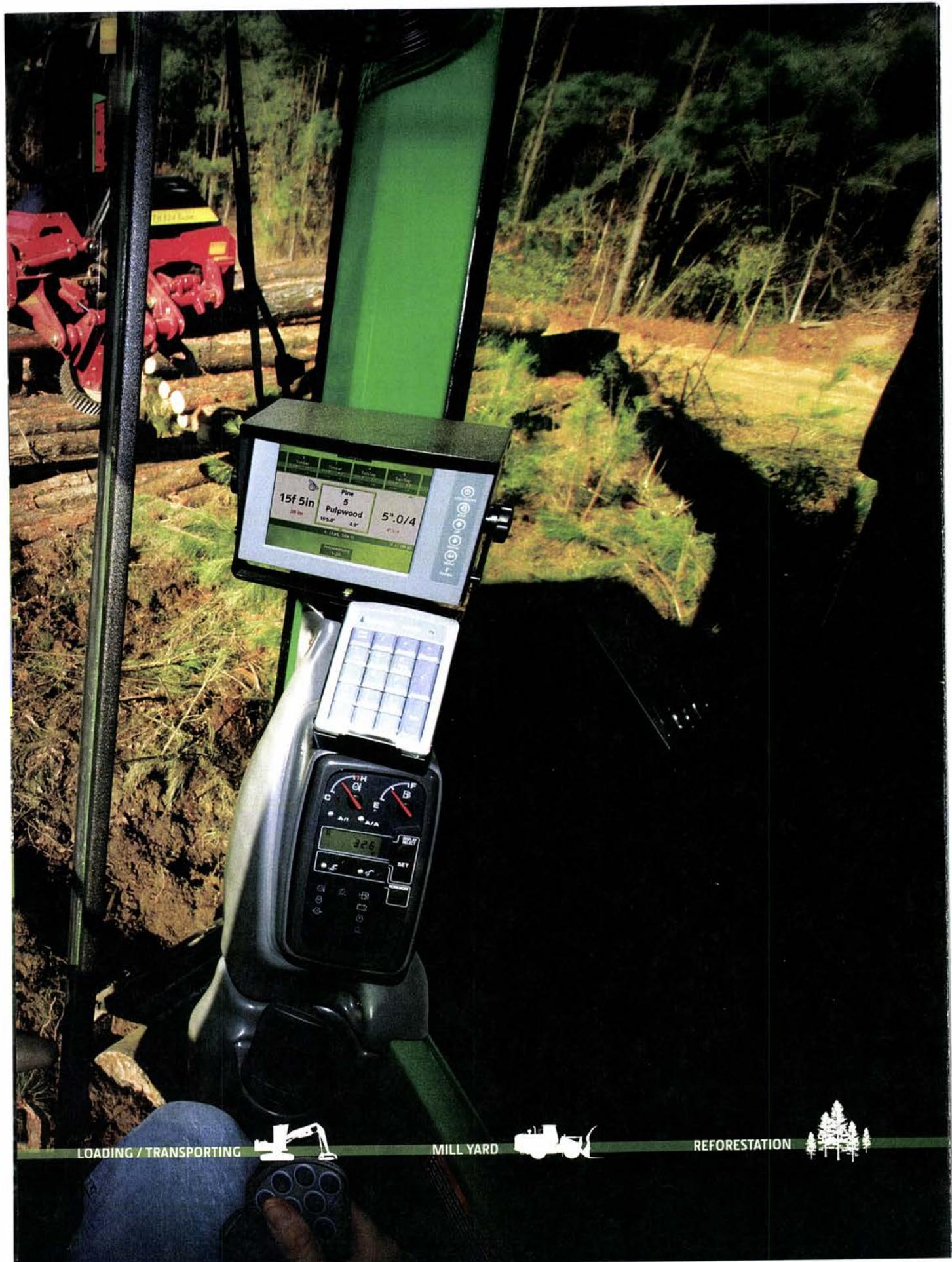
Energy Wood Harvesters  
182 hp (136 kW)

Compact Track Loaders  
6,800-10,825 lb (3,087-4,915 kg)

Skid Steers  
5,150-9,160 lb (2,338-4,159 kg)

Dozers  
16,500-78,000 lb (7,500-35,000 kg)

Complementary Attachments  
Attachment options vary by dealer and  
location.



LOADING / TRANSPORTING



MILL YARD



REFORESTATION





**JOHN DEERE**

## In the business of logging, from start to finish.

Why should you want end-to-end logging solutions from a single provider? If your partner is John Deere, it makes all the sense in the world. We already offer more than 100 models of high-quality, purpose-built equipment for the forest, known for their unmatched reliability. With our worldwide network of dealers, you'll know there's a John Deere dealer right there to immediately get you the parts and service you need to stay on the job. We also know the business side of logging—and can bring you the resources and support that only a global company can provide.

- A vast network of reliable dealers offering unmatched parts and service capabilities
- Product and application expertise to help you find the best worksite solutions
- Business services, including fleet management support, consulting, financial planning, operator training and servicing options
- Financing and leasing through a well-established, exceptionally stable lender—John Deere Credit

**For more information about John Deere Forestry systems, talk with your local John Deere dealer or visit us at [www.JohnDeere.com](http://www.JohnDeere.com).**

Some products and programs may not be available in all locations. Contact your local dealer for details.





**JOHN DEERE**

**BIOMASS HARVESTING SYSTEMS**

**HARVESTERS | FORWARDERS | ENERGY HARVESTER**



# FOREST HEALTH

Managing forest health is a massive job. Foresters and loggers along with other conscientious stewards of the forest work hard to promote and maintain a healthy forest. Yet they continue to face steep challenges and heavy pressures from stakeholders.

In North America, one of those challenges is the need to remove dead or dying timber, and to remove slash left over after harvesting. If left in the forest, slash and dead timber become hazardous fuels that can contribute to catastrophic forest fires. At times, the residual waste has been gathered and then open-air burned, which, while destroying the waste, releases harmful particulates into the air. However, regions are implementing no burn ordinances, thus increasing the need for biomass removal.

Fortunately, there is a solution: biomass harvesting. Biomass harvesting is an eco-friendly system of removing residual waste and overstocked, diseased and dying stands of trees and the resulting hazardous fuels. It offers an alternative to traditional methods of fuels reduction, and presents a new paradigm to the logging industry: how to make new money out of an old problem.





Slash burning (left) presents an additional problem: pollution. Overstocked timber stands encourage disease and insects (center) which destroy acres of forest every year. Beetles (far right) attack and kill large stands of pine annually.

*Center image: James Everett, Bugwood.org. Right image: Mark McGregor, USDA Forest Service, Bugwood.org.*



## A SIMPLE SOLUTION

John Deere Advanced Harvesting Systems offer an even better solution. The John Deere biomass harvesting system meets the need for fuels reduction and disease control in the forest, and allows loggers to get ahead at the same time. The John Deere Advanced Harvesting System has the potential to dramatically alter energy production — especially as non-renewable fuels like oil and gas become more costly.



The forwarder makes fast work of collecting the bundles of slash from throughout the forest and moving them near the road. Here, bundles are being stacked and prepared for transport.

“ The biomass bundles are an ideal renewable fuel. The advantage of this type of energy is that it is considered a waste in our economy, a cost, and has a negative impact on the environment by burning it in the slash pile — and we can change that. ”

**Gary Callihan**

*Vice President, Business Development for Envio Energi, Troy, Montana*

# BIOMASS HARVESTING

Biomass harvesting directly addresses forest health. When adopting an active forest management strategy, biomass harvesting becomes pro-active.

The first step in biomass harvesting is selective thinning of unhealthy and at-risk timber. The second step is processing — where the felled timber is removed from the forest. This task is easily managed by environmentally friendly wheeled harvesters and forwarders.

The last step is considered revolutionary. An energy harvester collects the material, tightly compresses it and wraps it, creating an energy bale or “bundle.” The material is then removed to roadside by the forwarder ready to be transported to a processing facility (i.e. power plant, wood pellet plant, etc).

## Here's how the process works:

1. A harvester enters the forest and fells specific trees, thinning the timber like a careful gardener.
2. The Energy Wood Harvester, Slash Bundler, follows later, gathering the slash, compressing it into manageable bundles which can then be transported and used as a biomass feedstock.
3. A forwarder follows the harvester and bundler, gathering the logs and bundles then moving them to roadside for transport.



# LEADING THE WAY

Biomass harvesting starts with one of four eco-friendly harvester models: the 770D, 1070D, 1270D, or 1470D. John Deere Energy Harvesters are compatible with a variety of Waratah Harvesting Heads, giving the harvester unprecedented versatility regardless of timber size.

John Deere Energy Harvesters are:

- Productive on slopes in excess of 35%.
- Exert low ground pressure and minimal soil disturbance with or without Eco-tracks.
- Provide excellent operator visibility for working in over-stocked timber stands.

The John Deere Harvesters are powered by fuel-efficient John Deere engines and guided by the Timbermatic 300 management system with Total Machine Control™ (TMC) for optimum performance and precision. In addition, quiet engines reduce range of disturbance to wildlife and people.



# MOVING FORWARD

The fuel-efficient John Deere D-Series Eco-III Forwarders come in five models: 810D, 1010D, 1110D, 1410D, and 1710D. Each model boasts excellent performance in all terrain, impressive fuel economy, and a variety of boom and bunk configurations to meet logger's specific needs.

The forwarders are also guided by TMC for precise operator machine control and increased productivity (available on the 1110D, 1410D, and 1710D). Excellent ground clearance, combined with large rubber tires and balanced bogies, make travel on rough ground unnoticeable.



# ENERGY ON THE MOVE

John Deere's 1490D Eco-III Energy Harvester is the first machine of its kind, allowing the industry to turn waste into something both useful and profitable — and all with an environmental edge.

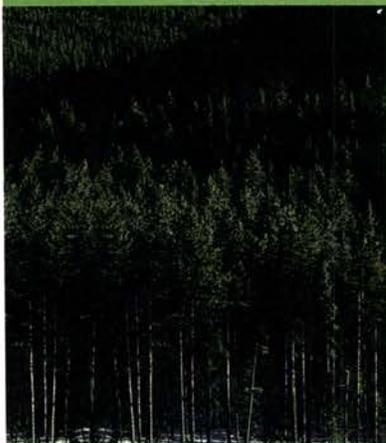
The 1490D is built with John Deere's B380 bundling unit. After gathering debris with its extended reach boom and purpose-designed grapple, the machine compresses the biomass material by approximately 80 percent — without crushing it. The unit pulls the compressed material forward and wraps it firmly with ordinary baling twine — creating a bundle. The bundle is dropped to the ground, where it is gathered by a forwarder. The bundles can then be transported and used as biomass fuel or feedstock.



# HIGH EFFICIENCY

The John Deere 1490D Eco-III Energy Harvester is capable of producing in excess of 25 bundles per hour where the worksite has been properly prepared. The operator can adjust the length of the finished compressed bundle, but the most common lengths are between 8 to 12 ft (3 to 4 meters). The ability to adjust bundle lengths helps maximize loads for various trailer configurations.

Depending on the species and moisture content of the material collected, each biomass bundle produces about one thermal megawatt of energy.



The B380 bundling unit compresses a volume of biomass material by approximately 80 percent without crushing it. This adds to the bundles' rigidity and transportability.

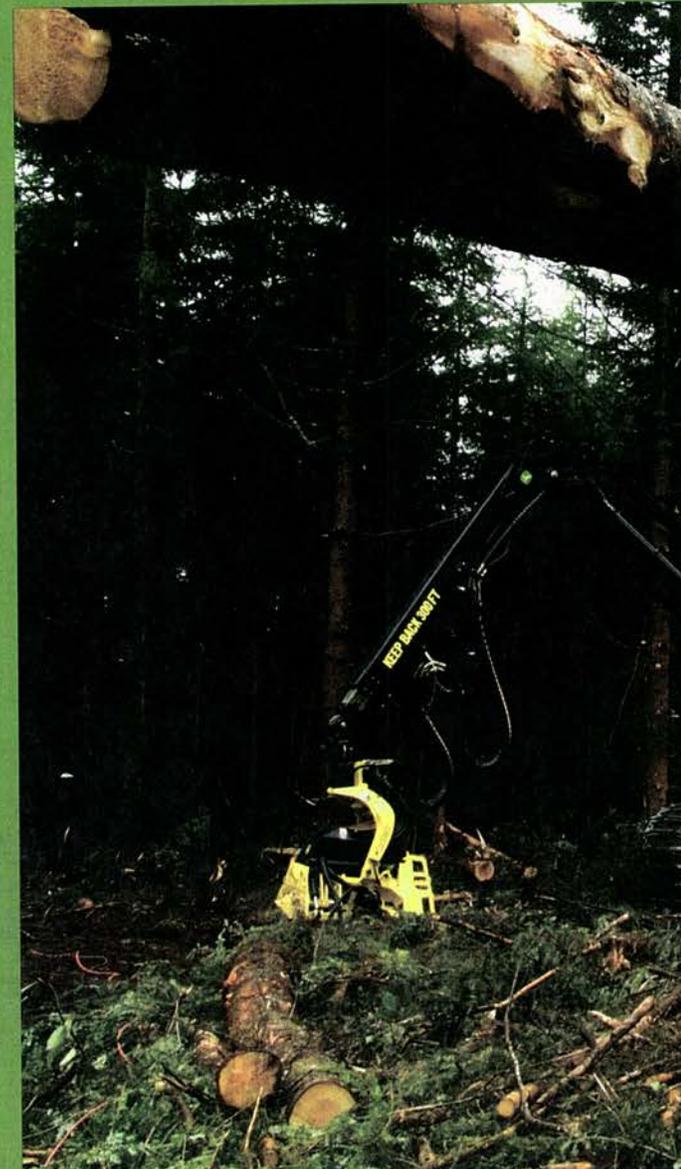
The basic 1490D features the same properties that have made John Deere the preferred supplier of forestry professionals worldwide. The bundling process, as well as the other functions of the machine, are controlled via the Total Machine Control™ (TMC) system. The machine is powered by a fuel-efficient John Deere engine with low emission levels and high torque at low rpm.

# PURPOSE-BUILT TO BE ENVIRONMENTALLY

John Deere's Wheeled D-Series Harvesters, D-Series Forwarder, and Energy Harvester take care of both biomass needs and the whole forest environment with purpose-built engineering details.

## Environmental considerations include:

- A light footprint averaging less than 7 psi of ground pressure — equal to that of a person walking on the ground.
- Patented balanced bogie system significantly reduces ground impact by evenly distributing the weight of the machine.
- Removable eco-tracks lighten the ground pressure even more.
- Long-reaching booms provide for minimal movement in the area.
- Powerful Tier-III engines ensure fuel-efficient productivity is not compromised by emission standards.



Native grasslands are being encroached upon by juniper and it's reducing the forage base for wildlife and domestic livestock. One of the things we are doing is trying to remove the juniper and get these grasslands restored. With biomass harvesting efforts and programs, we can get that material off the mountains, out of the woods, off the prairies — get it someplace where it can be utilized to convert over to energy, heat or bio fuels... make it usable. It just doesn't feel right to leave it on the landscape. ”

**Al Christophersen**

*Director of Habitat Stewardship Service, Rocky Mountain Elk Foundation*

RESPONSIBLE



# READY ENERGY

Bundled biomass is easy to process throughout the year. The compact slash logs can be conveniently stored in the forest or at a power plant in preparation for the peak seasons of energy production. The logs air-dry while they are piled up. As opposed to woodchips, a pile of slash logs will not ignite on its own.

John Deere wood energy technology is already widely used in Finland, Sweden, Spain, Italy, Switzerland, Czech Republic, and the U.S. In addition, the method has been successfully tested in Austria, France, Germany, and the UK, among others. Tests show that the bundling method is well-suited for North American species of trees and operating conditions.



# OPPORTUNITY KNOCKS

## Growing Prospects

Opportunities for loggers in biomass harvesting continue to grow, especially as the logging industry is just beginning to recognize the potential of biomass products, such as biofuels. Loggers have several prospects with a biomass harvesting system:

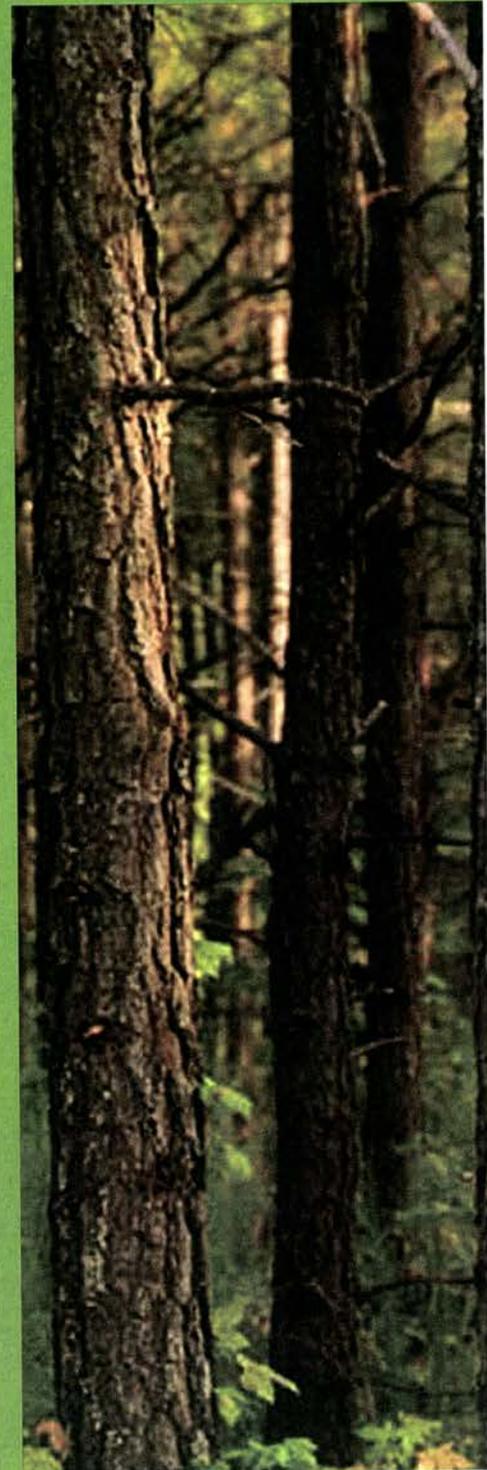
- Eco-friendly hazardous fuels reduction providing a clean, renewable energy source.
- Sell the energy bundles as an additional product.
- Bundles can be manufactured into biofuels, bio-chemicals, bio-wood products, erosion control material, wood pellets, and more.
- The bundles can be easily transported and stored until needed, without fear of spontaneous combustion.

John Deere has always taken the lead in educating about options and opportunities that exist within the forest industry, as well as in related industries like biofuels and energy production. John Deere's wood biomass harvesting demonstrations help to identify these opportunities, as well as to connect individuals who are eager to explore the possibilities.

“ We really appreciate this technology and the benefits it brings to wood-to-energy operations. Instead of leaving the money on the forest floor, this bundler is superb in collecting slash and treetops and putting them to use, rather than in a pile to be burned without revenue. ”

**Richard Lepine**

*President, KMW Systems, London, Ontario*



# JOHN DEERE: COMMITTED TO FOREST

John Deere takes environmental responsibility very seriously. Throughout the years, we have made it a priority to produce equipment with a low-impact on the environment while meeting all the demands of logging and staying ahead of the competition.



# HEALTH

We continue to look for new solutions to environmental concerns, new prospects for loggers, and have addressed forest health issues in several ways:

- Extensive research on the issues at hand.
- Educational materials.
- Engineering and design that promotes environmental health.
- Development of an effective biomass harvesting system.
- Educational demonstrations of a working biomass harvesting system.

For more information on biomass harvesting and John Deere, go to [JohnDeere.com](http://JohnDeere.com).





John Deere is the world's leading designer, manufacturer, and distributor of forest machines. Our range of purpose-built forestry equipment is without equal in the industry. From thinning to regeneration harvesting, for both cut-to-length and full-tree applications, John Deere builds woods-tough equipment with the logger in mind.





JOHN DEERE

NEW OPPORTUNITIES

## ENERGY FROM THE WOODS

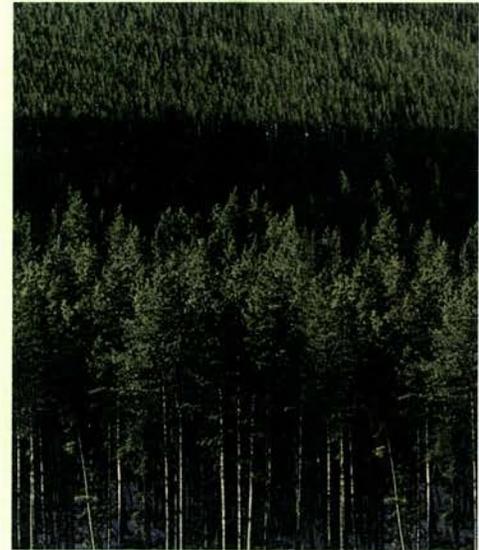
### BIOMASS HARVESTING

Woody biomass holds great promise as an environmentally sustainable and beneficial energy source that can provide renewable energy for our businesses, schools, and homes, not to mention our vehicles and equipment.

Beyond meeting our energy needs, the increased use of woody biomass will, among other things, address the challenges posed by climate change by advancing a low-carbon energy source, foster energy independence

and diversity, drive new energy technologies, protect our forest resources from fire and infestation, revitalize rural communities, and promote the importance of environmental stewardship.

For the promise of woody biomass to be fulfilled, however, innovators must provide new tools, financial services, and investments that encourage its harvesting and use in economical and environmentally sound ways.



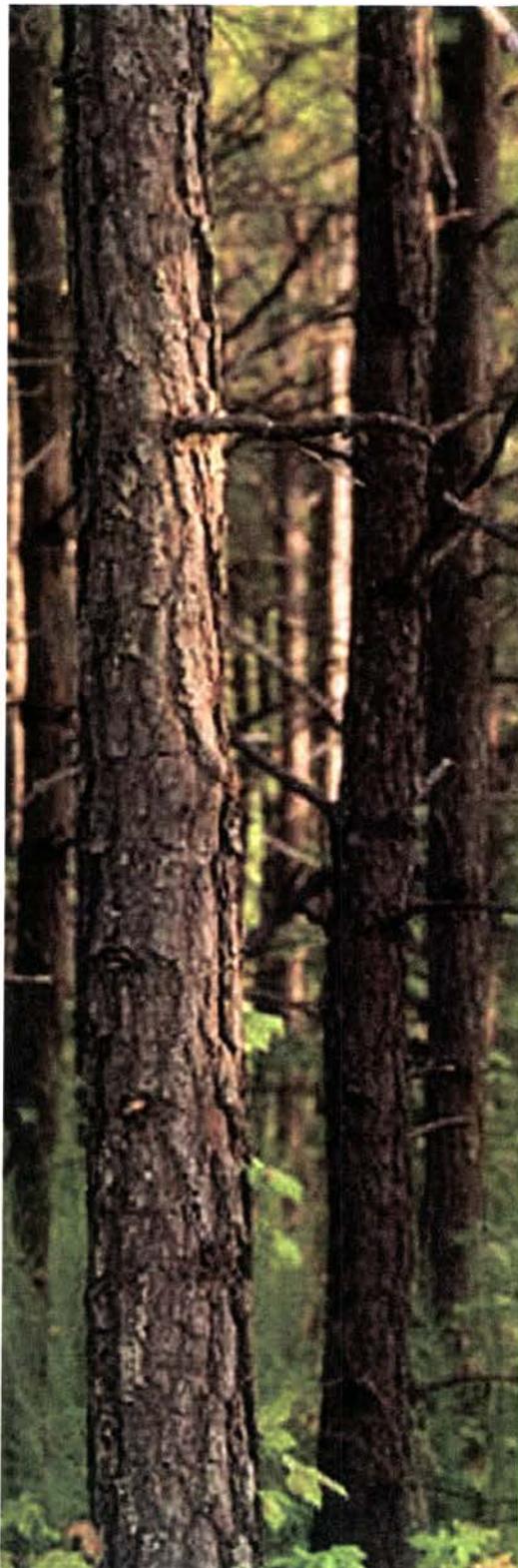
### JOHN DEERE DELIVERS

John Deere delivers innovative tools such as our energy wood-harvesting system, the 1490D Energy Wood Harvester – a truly one-of-a-kind technology, that collects woody biomass and bundles it into compact logs for immediate transportation, storage, and use.



John Deere Credit offers innovative financial services, including competitive equipment financing that permits environmental entrepreneurs more opportunities to use the John Deere energy wood-harvesting system and other forestry equipment.

John Deere Renewables can also champion innovative investments in woody biomass by supporting the development of renewable-energy power plants fueled by woody biomass, thereby turning the promise of woody biomass into reality.



## REALIZE THE PROMISE

Even with the innovations of John Deere and other organizations, the promise of woody biomass cannot be fulfilled without innovative public policies that encourage the responsible harvesting and use of woody biomass.

### Deere urges public officials at all levels to support the following policies:

- Provide incentives for utilizing woody biomass to equal those already provided to other sources of renewable energy.
- Craft “cap-and-trade” climate-change legislation to recognize active forest-management projects as a valid method of creating “offsets” that may be sold and purchased by businesses and others in order to reduce their greenhouse gas emissions.
- Strengthen funding for and enforceability of forest-stewardship contracts, which promote a close working relationship between the United States Forest Service and local communities, to improve forest health and facilitate a long-term and predictable supply of woody biomass.
- Increase financing and tax incentives for the development and use of advanced biofuels derived from woody biomass, including cellulosic ethanol.
- Expand the definition of “renewable biomass” found in the Energy Independence and Security Act to include fuels developed from properly harvested slash or pre-commercial thinnings from public land so that they can be applied to meet the Nation’s Renewable Fuels Standard.



[www.JohnDeere.com](http://www.JohnDeere.com)



DKB5044 (06-08)

Biomass harvesting can help generate sustainable renewable energy, improve forest health, and revitalize rural communities.



# HARVESTING

the potential of woody biomass

For more  
Mike Schr

# HARVESTING

solutions in our own backyard

DKBPNTLBS





### WHAT IS WOODY BIOMASS?

It's the dying and diseased trees in the forest. It's the branches and other leftovers from logging. But more importantly, it's one of the greatest untapped natural resources we have at our disposal. And if harvested in a sustainable way, offers an eco-friendly solution to some of our most pressing environmental, energy, and economic challenges.



For more  
Mike Schr

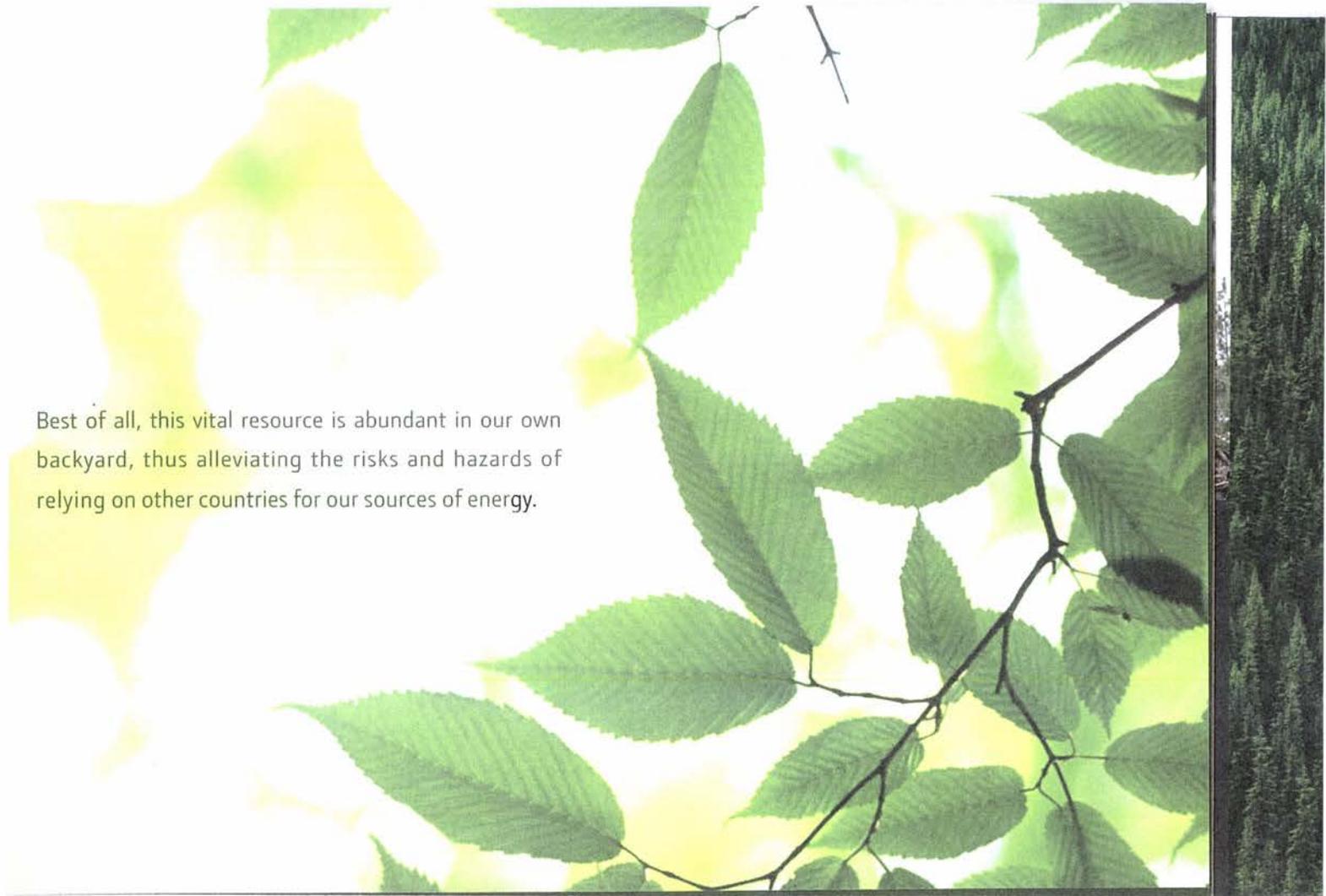
# HARVESTING

## a cleaner environment

Woody biomass is one tool in our arsenal that we can use to combat climate change and an ever-increasing dependence on foreign oil. It can be converted into fuel that can provide renewable energy for our businesses, schools, homes, not to mention our vehicles. And because wood sequesters carbon as it grows, in other words breathes in CO<sub>2</sub>, the net amount of CO<sub>2</sub> that is released back into the air during processing is far less than fossil fuels such as oil and gas. By using biomass as an energy source, we keep billions of tons of CO<sub>2</sub> from being released into the air.

DKBPNTLBS

Best of all, this vital resource is abundant in our own backyard, thus alleviating the risks and hazards of relying on other countries for our sources of energy.



For more  
Mike Schr

# HARVESTING

healthier forests

DKBPNTLBS



Every year wildfires destroy millions of acres of forest, in large part because they are fueled by biomass. Woody biomass serves as an accelerant and its presence on the forest floor can be the difference between a harmless lightning strike and a catastrophic wildfire. That's why we need to be proactive in our forest management rather than reactive. Research indicates that if more money were spent on biomass removal, not only would millions of acres be saved, but billions of dollars as well, money that would otherwise be spent on fighting forest fires.



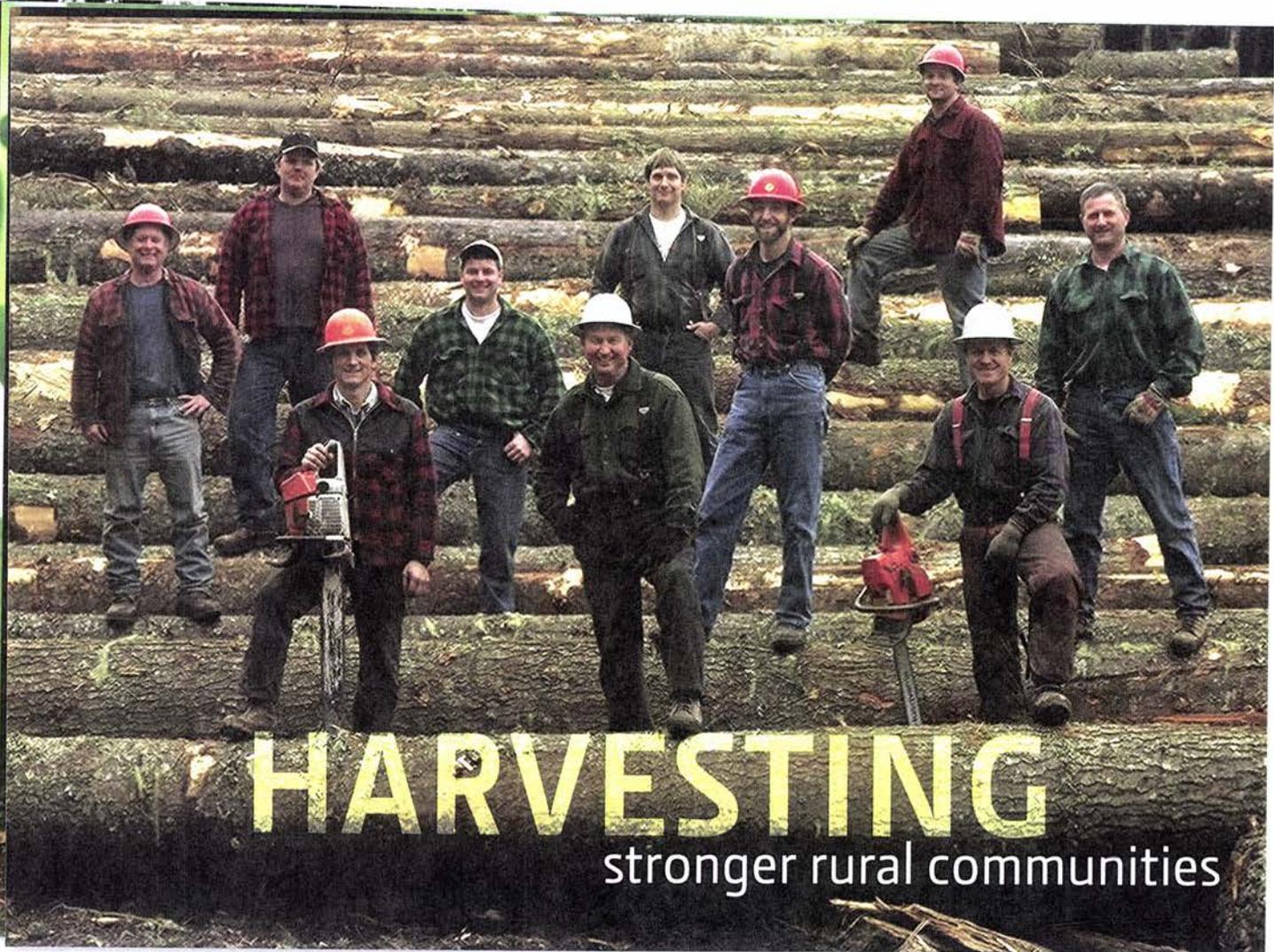
Beyond helping mitigate wildfires, biomass harvesting can help reduce devastating insect infestation. In North America alone, millions of acres have been destroyed by bugs that thrive in overstocked forests. By reducing the overstock (the dead and dying trees), we can help reduce the problem.



**The thought of machines going into forests may make some uncomfortable, but the truth of the matter is, the technology is available now to harvest woody biomass in a sustainable way with a minimal footprint.**



For more  
Mike Schr



# HARVESTING

stronger rural communities

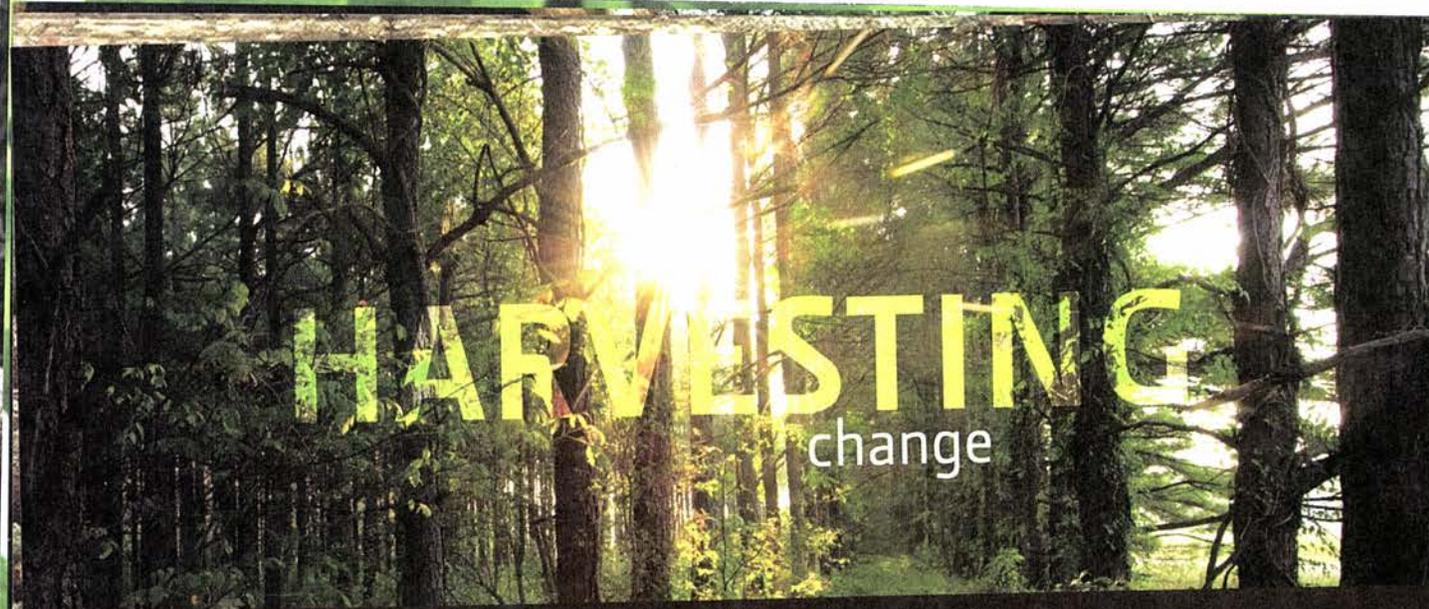
DKBPNTLBS



We're all feeling the pinch of some tough economic times, and some of the biggest victims are those in rural communities, especially forestry towns. Although the need for merchantable wood may be on the decline, harvesting non-merchantable materials such as woody biomass would offer forestry communities a new revenue stream that would help create jobs and keep towns forging ahead.

Bottom line...biomass harvesting has the potential to provide an economically viable outlet for forest byproducts that could stimulate the local economies of hundreds of smaller communities across North America.

For more  
Mike Schr



# HARVESTING

change

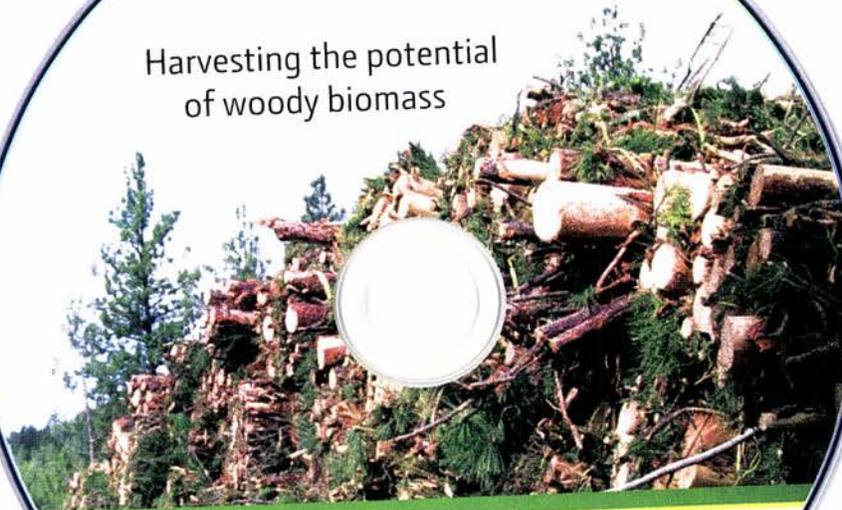
Because unlocking the potential of woody biomass is a relatively new concept, it needs a kickstart. That's where you come in. We need innovative public policies on a local, state, and federal level through which we can turn the promise of woody biomass into a reality.

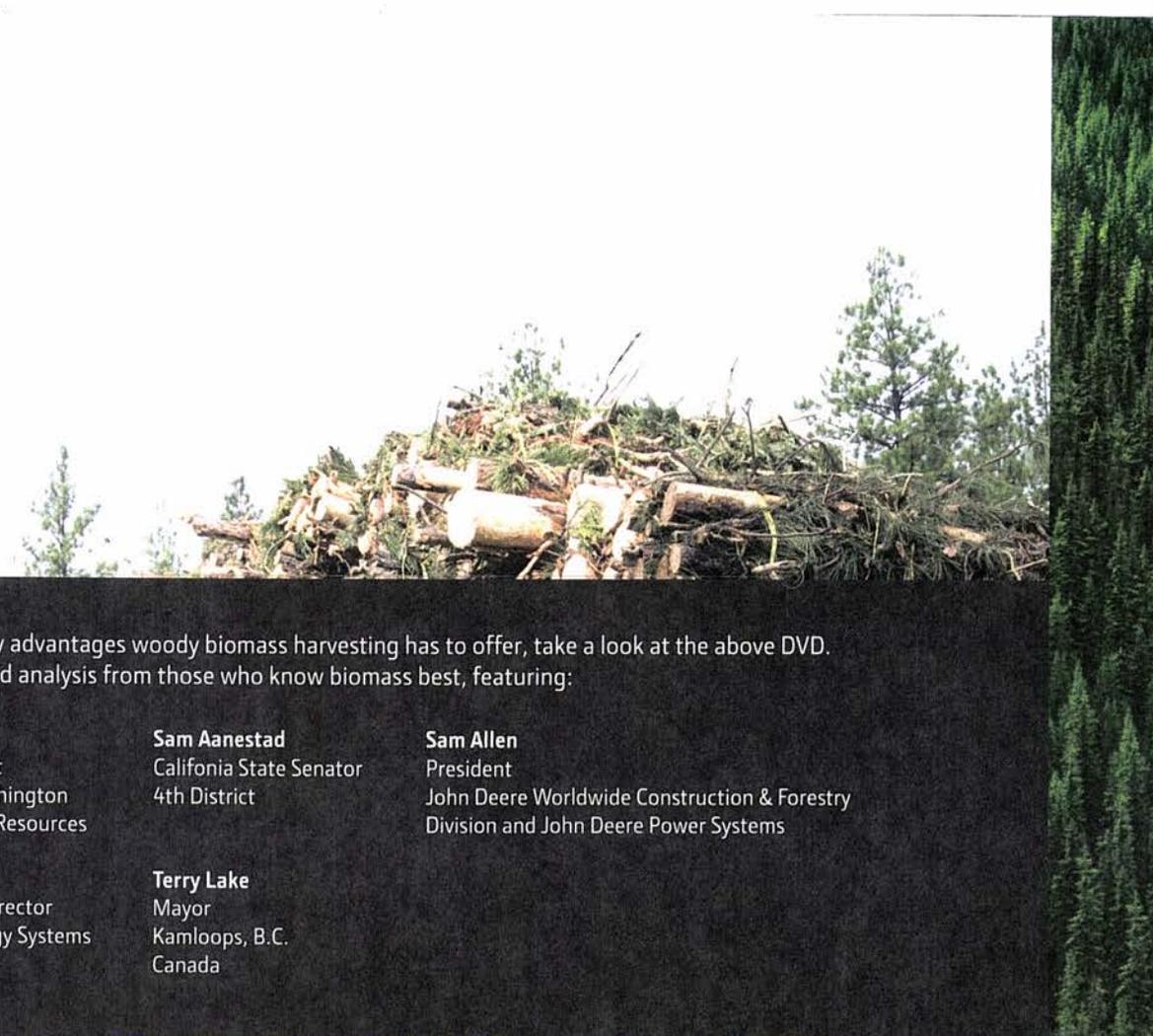
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- Expand the definition of renewable biomass to include fuels developed from properly harvested slash or pre-commercial thinnings from public and private land.
- Craft "cap-and-trade" climate-change legislation to recognize active forest-management projects.
- Strengthen funding for and enforceability of forest-stewardship contracts.

DKBPNTLBS

Harvesting the potential  
of woody biomass





For a snapshot of the many advantages woody biomass harvesting has to offer, take a look at the above DVD. It contains commentary and analysis from those who know biomass best, featuring:

**Larry Mason**  
Research Scientist  
University of Washington  
College of Forest Resources

**Sam Aanestad**  
California State Senator  
4th District

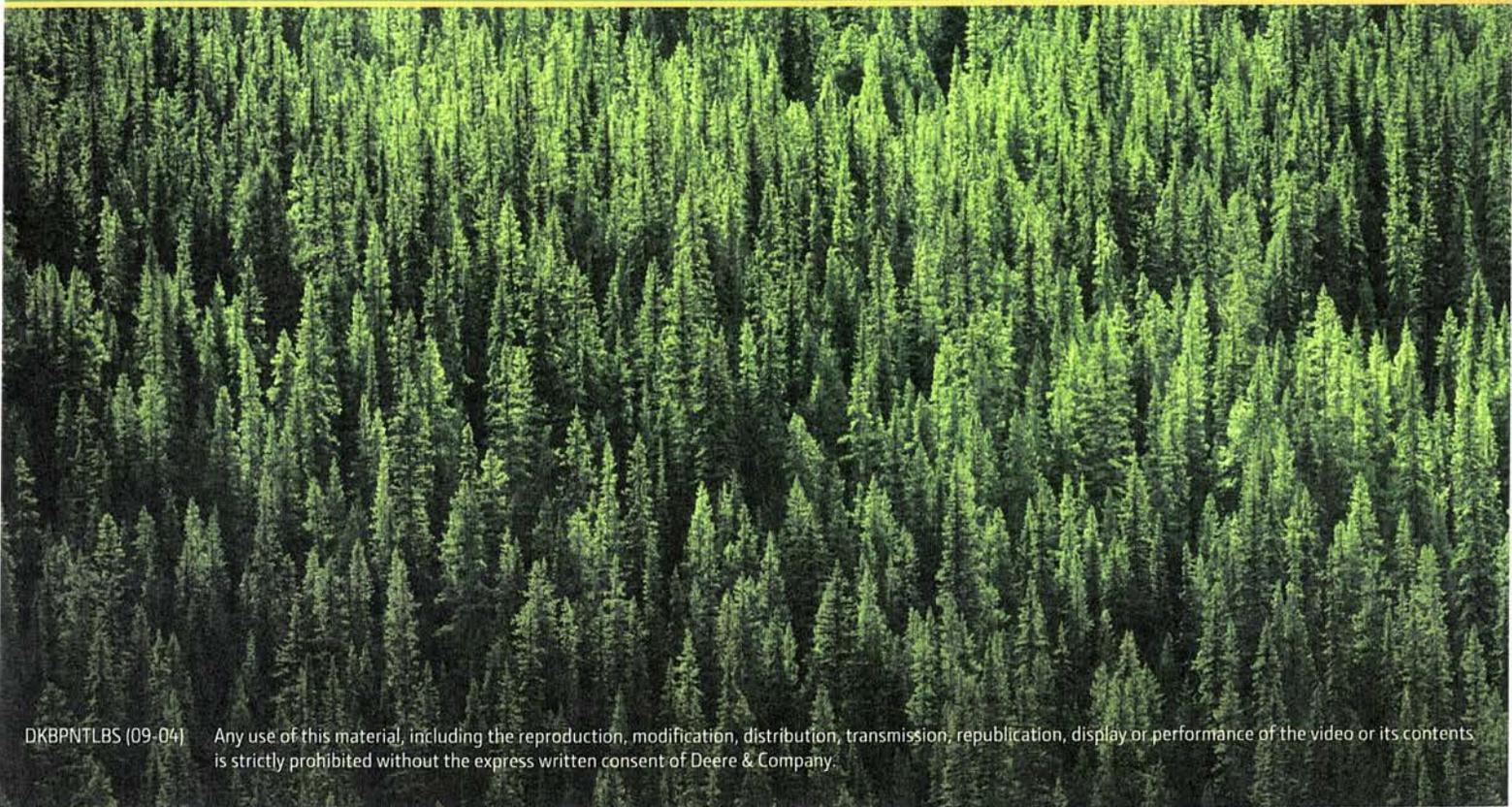
**Sam Allen**  
President  
John Deere Worldwide Construction & Forestry  
Division and John Deere Power Systems

**Robert Kingston**  
CEO/President/Director  
Dynamotive Energy Systems  
Corporation

**Terry Lake**  
Mayor  
Kamloops, B.C.  
Canada

For more information about woody biomass harvesting, contact:  
Mike Schmidt | Forest Renewables Manager | 563-340-2471

[www.JohnDeere.com/forestry](http://www.JohnDeere.com/forestry)



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F O R E S T R Y   E Q U I P M E N T

NOTHING RUNS LIKE A DEERE™

