

## Panel 3:

Verbindung von Wissenschaft und Praxis – Was muss getan werden, um die internationale, interkommunale Kooperation zu fördern?

Connecting science and practice – What has to be done to foster international and inter-municipal cooperation?

### **A perspective from Maine, United States**

Deutsch-Japanisches Symposium zu  
Klimaschutz und regionaler Entwicklung  
Tokyo

2. November 2016

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## Maine – der nordöstlichste Bundesstaat der USA

## メイン州 - 米国の北東



カナダと国境を接する、米国で最も北東の州  
Grenzt an die kanadischen Provinzen New Brunswick  
und Quebec

州のモットー： 先導する州 Motto: Dirigo

首都： オーガスタ市 Hauptstadt: Augusta

人口： 1 3 0 万人 Bevölkerung 1,3 Millionen

年間の来訪者： 3500万人  
35 Millionen Besucher p.a.

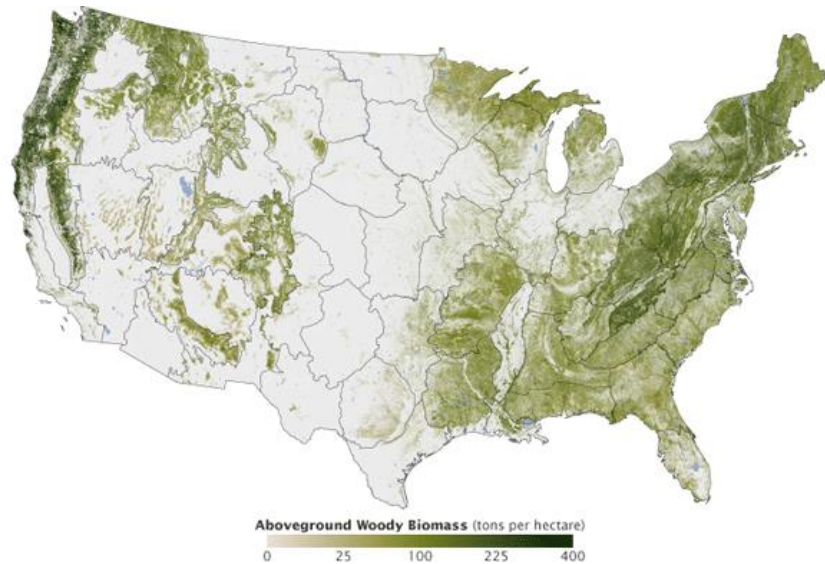
面積： 8万6千km<sup>2</sup> Fläche: ca. 1/3 der  
Bundesrepublik Deutschland

海岸線： 5千6百 km 5600 km Küste

大型外航船停泊港： 3 3 Tiefseehäfen

## Maine – eine 'resource-based economy'

## メイン州の天然資源をもととしている経済



Maine ist der am meisten bewaldete Bundesstaat der USA

メイン州は米国で最も森林地帯が多い州の一つです。

Maine hat daher einen wichtigen

Forstwirtschaftssektor

メイン州には林業の優れた伝統と蓄積があります。

Maine ist bekannt für Hummer (Maine Lobster)

メイン州のロブスターが有名です

Maine hat die meiste installierte Windkraft in Neu England

ニューイングランド州の最も風力発電





Klimawandel und seine Auswirkungen in Maine - kein neues Thema **メイン州の地球温暖化の影響**—最近のトピックではない



Fall/Winter 2008 · Vol. 17, No. 2 · \$14

# MAINE POLICY

R E V I E W

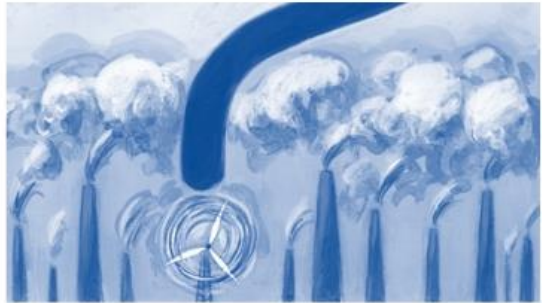
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CLIMATE CHANGE AND MAINE ECONOMIC ACTIVITY

## The Effects of Climate Change on Economic Activity in Maine: Coastal York County Case Study

by Charles S. Colgan  
Samuel B. Merrill



*Climate change can have significant ramifications for Maine's economy. If short-term projections for the next century are accurate, at minimum sea level rise will become increasingly noticeable in association with more severe and destructive coastal storms. Charles Colgan and Samuel Merrill evaluate risk estimates by presenting a case study of the projected consequences of sea level rise and coastal storm damage on the economy of the state's most vulnerable area, York County's coastal communities.*



## Aber die Nachrichten weisen auf dramatische Entwicklungen hin ただし、最近ノニュースは由々しい

CLIMATE CHANGE

### Maine's Lobsters Could Go Extinct in 85 Years Because of Global Warming

By Clint Rainey

September 27, 2016  
9:58 a.m.



How's Greenland this time of year?  
Photo: David Croxall / EyeEm/Getty Images/EyeEm

It's been a **full three weeks** since the last round of dire seafood-related news, so to shake everyone out of their complacency, a new study by University of Maine scientists **has dropped the bomb** that rising ocean temperatures are such a problem for baby lobsters that by the year 2100 you can say good-bye to lobster rolls if waters continue warming at the current rate. Their study, which appears in this month's issue of ICES Journal of Marine Science, found larvae can't

thrive in water that's five degrees above the current temperature in the Gulf of Maine, which is where America's primary lobster fishery is located. To put that in context, they note the U.N.'s climate-change panel predicts the Gulf of Maine will be five degrees warmer in 2100, just 84 years from now.

Experts tell the Associated Press the report's findings are "a wake-up call" to the seafood's plight, and also to the fact that lobster fishermen have it worse than anyone really thought. Their industry is sort of enjoying boom times right now; they've brought in more than 100 million pounds of lobster now for seven years straight. But the dastardly effects of climate change **are already obvious** in south New England, where there's already been "a near total collapse" of the lobster population off Rhode Island, and the annual catch below Cape Cod has shrunk from 22 million pounds in its prime (1997) to 3 million pounds today. Climate change will keep whittling those stocks down further.

Also, interestingly: Higher temperatures also cause baby lobsters to develop super fast, which could be great for avoiding predators in the wild, if only they survived long enough to put their new mutant bodies to use.

Quelle: Associated Press, September 27, 2016

BUSINESS

Posted June 27 | Updated June 28

## Climate change threatens to sink Gulf of Maine fishing industry

As waters warm, valuable species migrate and the fishing fleet shrinks.

BY PATRICK WHITTLE THE ASSOCIATED PRESS

Share      38 Comments



Elijah Voge-Meyers carries cod caught in the nets of a trawler off the coast of New Hampshire in April. Fishermen in the northeastern U.S. are struggling with warming waters that have transformed some of the country's oldest commercial fisheries. Associated Press/Robert F. Bukaty

Associated Press / Portland Press Herald, June 27, 2016





# CLIMATE CHANGE INSTITUTE

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## Maine Forests

### Understanding the Impact of Climate Change on Maine's Forests

R. G. Wagner, School of Forest Resources

Maine's forests have always been influenced by a changing climate and the future will be no different. If the past is any indication, projected global warming over the coming century will likely alter the growth and species composition of Maine's forest. Predicting the nature of these changes, however, is a challenging task.

<http://climatechange.umaine.edu/>



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Harold W Borns Symposium  
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SEPTEMBER 15, 2016

## Report: Maine loggers contribute \$882M to state economy

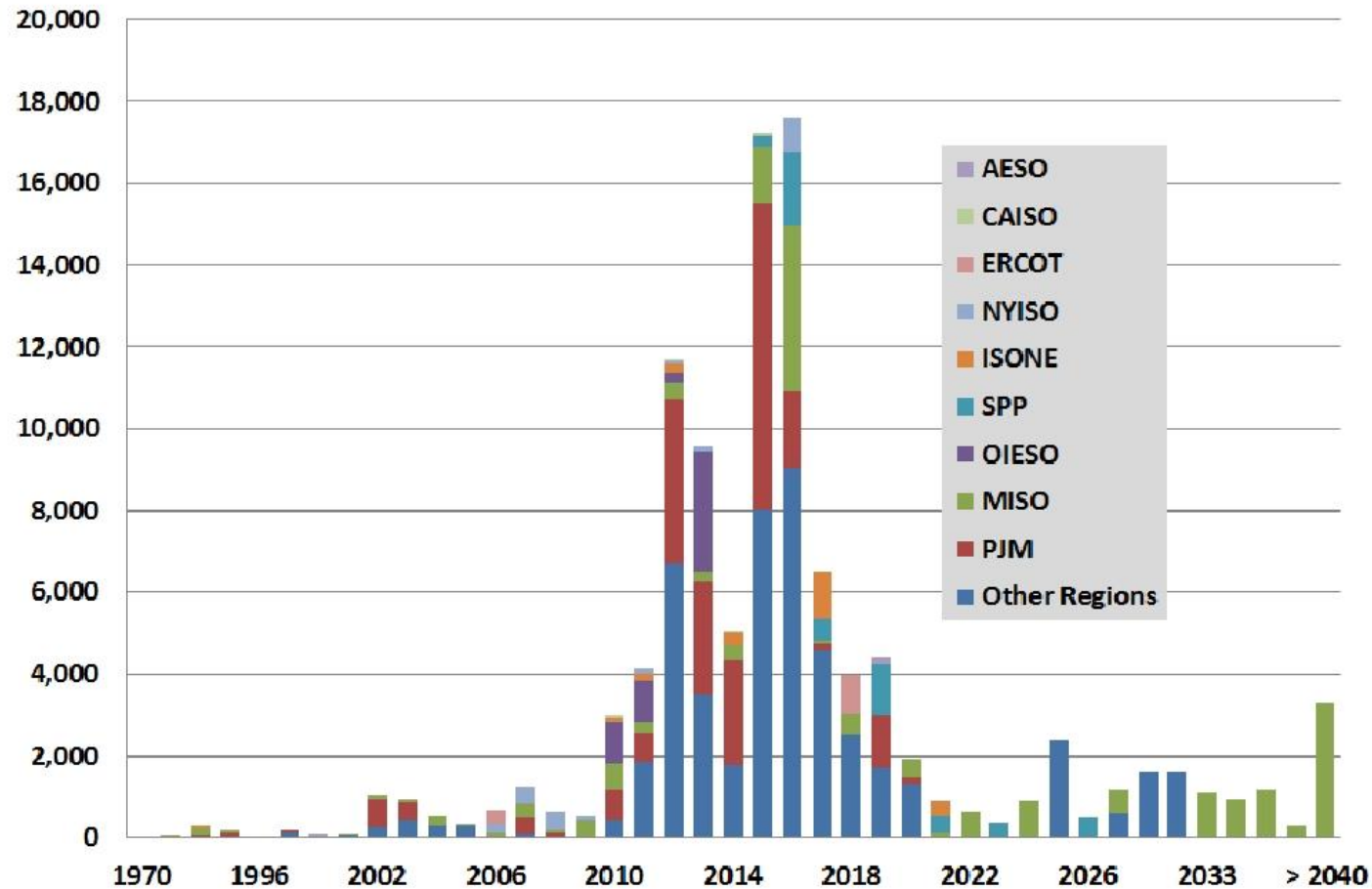


PHOTO / TIM GREENWAY

Tom Cushman, owner of Maine Custom Woodlands, on a feller buncher in the woods in Gray. According to a new report by the Professional Logging Contractors of Maine, companies like Maine Custom Woodlands contribute a combined \$882 million to the state's economy.

Quelle: MaineBiz

## US Coal Plant Retirements by ISO/RTO (MW)



Insgesamt 34GW  
Kohlekraftkapazität wird in den  
USA still gelegt

石炭火力発電容量の34GWは退  
役されています

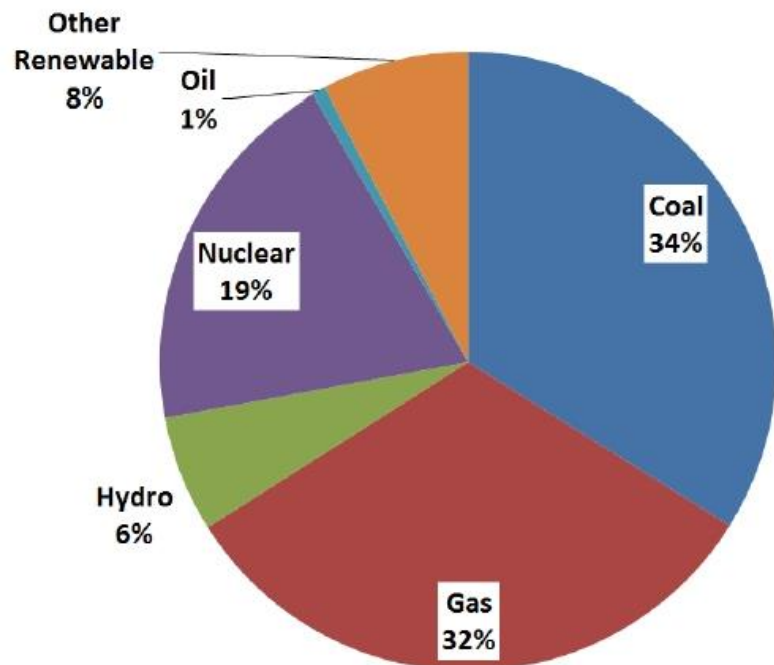
Quelle: Pennwell GenerationHub Quarterly  
Market Update, February 24, 2016



# RECENT TRENDS

## US Electric Utility Fuel Mix – Electric Generation

Most Recent 12 Months –  
Ending November 2015



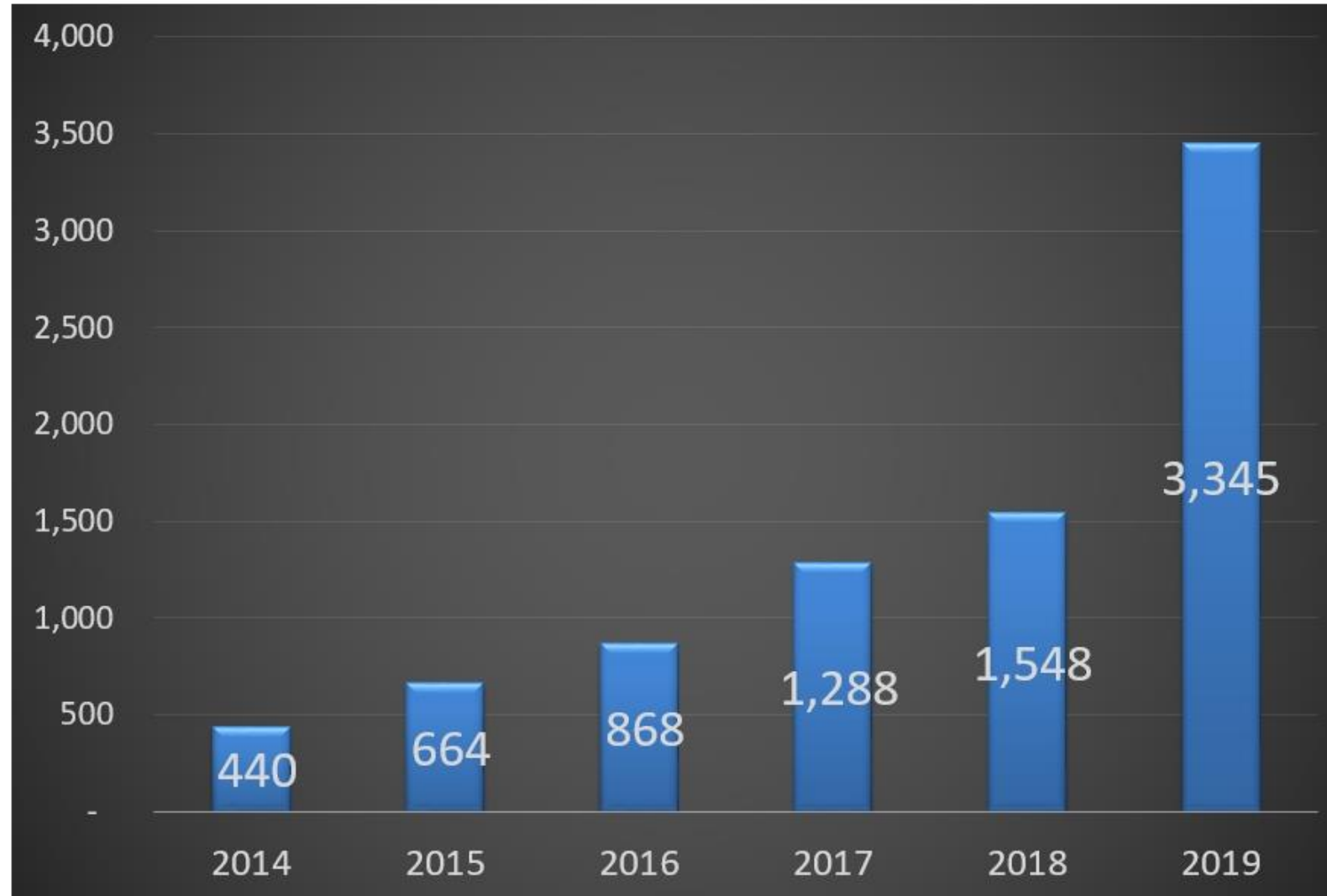
Most Recent 12 months ending  
November, 2015 compared with  
same period in prior year:

Gas	13.4%
Coal	-16.5%
Nuclear	0.7%
Hydro	-3.1%
Other Renew	7.5%



# Maine Wind Projects

## Cumulative Installed MW's



Eine Herausforderung: lokale Stromerzeugung in ländlichen Gegenden; in Maine und anderswo  
一つの課題：農村地域におけるローカル発電。メイン州、またはその他の地域で



Gezeitenstromkraftwerk, installiert in Cobscook Bay, Maine (2012)  
Das erste Gezeitenkraftwerk mit Netzanschluss und PPA in Nord Amerika  
Protoyp mit gutem Potenzial für Küstenregionen

潮流発電機、Cobscook湾、メイン州（2012年）  
北米で初めての電力購入契約付接続しました潮流発電機  
海岸沿いの村のためのプロトタイプ



Flusstromkraftwerk, installiert im Kvichak Fluss, Alaska (2015)  
Stromerzeugung für die Native American Community, anstelle von  
Dieselgeneratoren

川の流れを使用する発電機、Kvichak川、アラスカ州（2015年）  
ネイティブアメリカンの部族のディーゼル発電機  
の代わりにこの発電機



## Endgültiges Ziel beider Projekte:

Energieerzeugung in ländlichen und abgelegenen Gemeinden, Kostensenkung und GHGE Reduzierung  
Lokale Supply Chain, wirtschaftlicher Nutzen für ländliche und abgelegene Gemeinden

## 両プロジェクトの究極の目標:

農村&遠隔地で発電コストの下げ、GHGEの削減  
地元のサプライチェーン、農村部や遠隔地のための経済的利益

SEPTEMBER 2, 2016

### Eastport Update: Electric Power from the Sea

Eastport ME, Economic Life

Eastport Update: Electric Power from the Sea



Quelle: American Futures.org



*This run of river device has the potential to provide nearly 90% of Igiugig's power needs.*



Quelle: U.S. Senator for Alaska, Lisa Murkowski

## Ocean Renewable Power Company (Maine) as an example of U.S. federally co-funded renewable energy R&D

### Project Partners:

City of Eastport, Maine

Eastport Port Authority, Maine

Town of Lubec, Maine

Homer Electric Association, Alaska

Village of Igiugig, Alaska

### Research & Development Affiliations:

Cobscook Bay Resource Center

Dartmouth College - Thayer School of Engineering

Florida Atlantic University – Dept. of Ocean and Mechanical Engineering

Maine Maritime Academy

[National Renewable Energy Laboratory, Colorado](#)

New England Aquarium, Massachusetts

[Northwest National Marine Renewable Energy Center](#)

Pennsylvania State University – Applied Research Laboratory

[Sandia National Laboratories, New Mexico](#)

[United States Department of the Navy - Naval Surface Warfare Center](#)

### Research & Development Funding Partners:

Alaska Energy Authority

The Denali Commission

Maine Technology Institute

Maine Technology Asset Fund

[United States Department of Agriculture](#)

[United States Department of Energy](#)

University of Alaska-Anchorage - College of Engineering

University of Alaska-Fairbanks - Alaska Center for Energy and Power

University of Colorado - Geotechnical Engineering and Geomechanics

Université Laval - Département de génie civil et de génie des eaux

University of Maine - Maine Tidal Power Initiative

University of Maine - School of Marine Sciences

University of Maine Sea Grant and Cooperative Extension

University of Massachusetts-Dartmouth - School of Marine Science & Technology

University of Washington - Mechanical Engineering



## **Es braucht die grossen und die kleinen Schritte sowie deren Finanzierung:**

- Nationale und regionale Änderungen im Strommix
- Entwicklung neuer Technologien, einschliesslich Nischentechnologien
- Finanzielle Förderung durch Regierungen für kleine und grosse Projekte, kleine und grosse Unternehmen (!)
- Angemessene Genehmigungsverfahren für Erneuerbare Energien
- Technologietransfer bei Wahrung von IP

## **大小の手順だけでなく、資金調達が必要：**

- 国内、または地方レベルでの発電源のミクス
- ニッチな技術を含む新技術の開発
- 小規模および大規模なプロジェクトのための政府による財政支援、小規模および大企業（！）
- 再生可能エネルギーのための適切な承認手続き
- IPを維持しながらの技術移転



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