Power to the People

Michigan’s energy production, health impacts & opportunities
August 20, 2015 presentation to Michigan Power to Thrive Coalition
Impacts of Burning Coal for Electricity
Electricity generation is responsible for roughly half of all toxic air pollution from stationary sources in the U.S.

2009 EPA Toxic Release Inventory Data Analysis by National Resources Defense Council
http://switchboard.nrdc.org/blogs/paltman/the_toxic_20_states_with_the_h.html
## The Toxic Twenty

<table>
<thead>
<tr>
<th>State</th>
<th>Electric Sector Rank by In-State Toxic Air Pollution</th>
<th>Total Industrial Toxic Air Pollution (lbs)</th>
<th>Electric Sector Toxic Air Pollution (lbs)</th>
<th>Electric Sector Contribution to State Toxic Air Pollution (%)</th>
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</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>1</td>
<td>68,863,474</td>
<td>44,545,704</td>
<td>65%</td>
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<tr>
<td>Pennsylvania</td>
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<td>50,527,280</td>
<td>41,459,532</td>
<td>82%</td>
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<tr>
<td>Florida</td>
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<td>49,039,948</td>
<td>33,442,431</td>
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<tr>
<td>Kentucky</td>
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<td>Maryland</td>
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<td>26,798,135</td>
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<tr>
<td><strong>Michigan</strong></td>
<td>1</td>
<td>31,276,291</td>
<td>22,731,782</td>
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<td>West Virginia</td>
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<td>21,486,688</td>
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<td>Georgia</td>
<td>1</td>
<td>41,902,848</td>
<td>18,246,617</td>
<td>44%</td>
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</table>

**Michigan ranks 7th worst out of 50 states for air pollution from power plants.**
In Ingham County, Lansing Board of Water & Light coal plants are the largest stationary emitters of CO$_2$, NO$_x$, SO$_2$, PM2.5, and PM10---and are the largest emitter overall of air emissions by volume.

Electricity production accounts for 37% of all CO$_2$ emissions in the U.S.
Data is estimated 2010 impacts. All monetary values are expressed in thousands of dollars.
<table>
<thead>
<tr>
<th>County</th>
<th>Name (units)</th>
<th>Size (MW)</th>
<th>Utility</th>
<th>Retirement</th>
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<tr>
<td>Bay</td>
<td>Dan E Karn (2)</td>
<td>544</td>
<td>Consumers</td>
<td>2016, 2022?</td>
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<tr>
<td>Bay</td>
<td>JC Weadock (2)</td>
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<td>Consumers</td>
<td>2015</td>
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<td>Escanaba</td>
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<td>LBWL</td>
<td>2015, 2016, 2020?</td>
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<td>MSU</td>
<td>2016</td>
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<tr>
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<td>WE</td>
<td>2020</td>
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<td>Shiras</td>
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<td>Monroe</td>
<td>3,280</td>
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<tr>
<td>County</td>
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<td>Size (MW)</td>
<td>Utility</td>
<td>Retirement</td>
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<tr>
<td>Muskegon</td>
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<td>Consumers</td>
<td>2015</td>
</tr>
<tr>
<td>Oakland</td>
<td>Pontiac North</td>
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<td>Ottawa</td>
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<td>Ottawa</td>
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<td>St Clair</td>
<td>Belle River (2)</td>
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<td>St Clair</td>
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<td>2020?</td>
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<tr>
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<td>Marysville</td>
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<td>DTE</td>
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<tr>
<td>Wayne</td>
<td>Trenton (3)</td>
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<td>DTE</td>
<td>2015, 2016, 2018?</td>
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<tr>
<td>Wayne</td>
<td>Wyandotte</td>
<td>32</td>
<td>Wyandotte</td>
<td>2016?</td>
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</table>
Why care about this?
New Climate Projections for Michigan

New research summarized here projects significant consequences for Michigan as soon as the next few decades, increasing in severity into the middle and end of this century. This report considers these consequences in terms of three time frames: 2010–2039 ("the next few decades"), 2040–2069 ("mid-century"), and 2070–2099 ("toward the end of the century"). We compare these periods with the climate in Michigan during 1961–1990 ("the historical baseline").

Toward the end of the century, if current pollution trends continue, projected effects in the state include:

Far more scorching summers

- Every summer in Michigan would be hotter than 2005—the state's hottest summer of the last half century.
- Detroit would experience almost 65 days per summer with highs over 90 degrees Fahrenheit (°F) and 23 days per summer with highs over 100°F.
- Detroit would face around two heat waves per summer like the one that killed hundreds in Chicago in 1995.
- Air quality would deteriorate, as hotter weather causes more severe smog problems (assuming similar levels of tailpipe and smokestack emissions). This would have serious consequences for public health, including a greater incidence of asthma attacks and other respiratory conditions.

Dangerous storms and flooding

- Heavy rains would become more common throughout the year, leading to a greater incidence of flash flooding.
- Winters and springs, when the flood risk is already high, would become more than 25 percent wetter.

New threats to agriculture

- Crops and livestock would face substantially more heat stress, decreasing crop yields and livestock productivity.
- Warmer winters and a growing season up to six weeks longer would enable pests like the corn earworm to expand their range.
- Crop production would be inhibited by changing rain patterns such as wetter springs (which delay planting and increase flood risk) and almost 10 percent less rain during the increasingly hot summers.
On August 11, 2014, southeast Michigan experienced record rainfall, exceeding six inches in some areas.

President Barack Obama has declared a major disaster for Macomb, Oakland and Wayne counties due to the torrential rain and flooding. This presidential disaster declaration provides individual assistance for people affected by the flooding, and public assistance for governments to cover emergency work and damages to public facilities and infrastructure.

For ongoing updates, follow the MSP/EMHS on Twitter @MichEMHS.

• Shattered Detroit’s all-time Aug. 11 rainfall record of 2.06” in 12 hr period

• 4.57” rainfall was second highest all-time daily rainfall record in Detroit history

• Statistically, based on old weather, a 500-year rain event

Scorching hot weekend in Michigan; some spots will hit 94 degrees

Michigan has a hot, summery weekend on the way. The hottest weather will be in an area you wouldn’t expect.

1 - www.clickondetroit.com/weather/great-flood-of-2014-how-historic-was-it/27580888
2 - www.mlive.com/weather/index.ssf/2015/08/scorching_hot_weekend_in_mich.html#incart_m-rpt-2
Warren
18,047 structures damaged, whose total cash value is $1.2 billion
Overall damage estimate not been determined, though it could be several hundred million based on that cash value
One-third of homes damaged by the flood

Dearborn
40% of its homes and businesses damaged
75% of roads shut down

Mike Edgil of Hazel Park, Mich., is overwhelmed as he describes how the water rose in his family's basement to a friend on the phone Tuesday morning, Aug. 12, 2014, following a torrential rainstorm Monday that caused flooding throughout metro Detroit.

(Photograph: Regina H. Boone, Detroit Free Press)
The number of patients calling in for appointments for allergies has just skyrocketed," said Skoner.

The American College of Allergy, Asthma and Immunology says a top reason for that is climate change.

Higher temperatures and carbon dioxide levels are affecting plants, and that’s leading to more allergies.

Bielory says the worsening pollen is especially dangerous for children who already have respiratory problems.

"And you will cause an inflammatory mix, or what I call the 'witches brew', where we have the temperature, ozone and pollen all mixed together, you will cause an incredible inflammatory response of the eyes, nose, and therefore in those who are more prone to it, the lungs as well, leading to more asthma," he said.

http://michiganradio.org/post/climate-change-fueling-increase-pollen-allergies#stream/0
Is asthma really a problem?
Yes. Asthma is a serious health and economic concern in the United States. It's expensive.
- Asthma costs the United States $56 billion each year.
- The average yearly cost of care for a child with asthma was $1,039 in 2009.

In 2008, asthma caused:
- 10.5 million missed days of school
- 14.2 million missed days of work

It's common.
In 2010:
- 18.7 million adults had asthma. That's equal to 1 in 12 adults.
- 7 million children had asthma. That's equal to 1 in 11 children.

It's deadly.
- About 9 people die from asthma each day.
- In 2009, 3,388 people died from asthma.
We don't know for sure what causes asthma, but we do know that attacks are sometimes triggered by:

- Allergens (like pollen, mold, animal dander, and dust mites)
- Exercise
- Occupational hazards
- Tobacco smoke
- Air pollution
- Airway infections

There's no cure for asthma. People with asthma can manage their disease with medical care and prevent attacks by avoiding triggers.

It's getting worse.

In the last decade, the proportion of people with asthma in the United States grew by nearly 15%. In 2009, asthma caused:

- 479,300 hospitalizations
- 1.9 million emergency department visits
- 8.9 million doctor visits

1 in 4 black adults can’t afford their asthma medicines.

1 in 5 Hispanic adults can’t afford their asthma medicines.

1 in 5 children with asthma went to an emergency department for asthma-related care in 2009.
Asthma prevalence among adults - percent of adults ever diagnosed

In general, the number of adults diagnosed with asthma was higher in many states in 2008 compared to 2005. Click to search Asthma data.

CDC’s Environmental Public Health Tracking
www.cdc.gov/ephtracking
Asthma Prevalence Among Adults

Asthma prevalence among adults - percent of adults ever diagnosed

In general, the number of adults diagnosed with asthma was higher in many states in 2008 compared to 2005. Click to search Asthma data.

CDC’s Environmental Public Health Tracking
www.cdc.gov/epitracking
Adult current asthma prevalence was higher among non-Hispanic multirace persons than non-Hispanic whites in Michigan; however, rates were higher among non-Hispanic multirace persons and non-Hispanic blacks throughout the U.S.
Child current asthma prevalence was higher among non-Hispanic multirace persons and non-Hispanic blacks than non-Hispanic whites in Michigan. A similar pattern occurred throughout the 38 participating states.
Cost of Asthma & Coal in Michigan

- 17,000 asthma-related hospitalizations each year in Michigan, at an average cost of $11,671 = $394 M / year\(^1\)

- Pollution generated by Michigan coal plants is responsible for 68,000 asthma attacks and 180 premature deaths each year\(^2\)

- Michigan’s oldest coal-fired electricity plants cost Michiganders $1.5 billion annually in health care expenses.\(^2\)

2 – Environmental Health and Engineering, Inc. "Public Health Impacts of Coal-Fired Power Plants in Michigan"
Opportunities
Public Act 295 of 2008 established a “Renewable Portfolio Standard” for Michigan. It requires electric providers to achieve a retail supply portfolio that includes at least 10% renewable energy by 2015.
CO$_2$ EMISSION RATE REDUCTION TARGETS

State targets range from 215 – 1,783 lb-CO$_2$/MWh
20 States Will Be More Than Halfway Toward Meeting Their 2030 Benchmarks (Rate-Based Compliance)

Progress Toward 2030 Targets
- > 100%
- > 75%
- > 50%

*While as individual states, Delaware, New Hampshire, Rhode Island, and New York do not exceed their 2030 final targets, we assume they will as members of the nine-states Northeast Regional Greenhouse Gas Initiative (RGGI). Collectively, the RGGI states are projected to be more than 200% of the way toward their combined 2030 emission reduction targets under the Clean Power Plan. Alaska, Hawaii, and Vermont have no obligations under the Clean Power Plan.*
States have 13 months to devise their own implementation plans before submitting them to the EPA.

EPA has set forth four principal building blocks that the states can use:

- Six percent improvements to the heat rate (fuel efficiency) of coal-fired power plants.

- Dispatching low-carbon generation such as natural gas-fired combined cycle units ahead of coal-fired generators, increasing capacity factors on these units to 70 percent, far higher than today’s average of 46 percent.

- Utilizing zero-carbon generation such as renewables and nuclear.

- Expand energy efficiency and demand-side management with a 1.5 percent improvement each year.
Get the Governor and MDEQ Director to commit to a comprehensive public engagement process regarding how Michigan will comply with the Clean Power Plan limits.

Possible pitfalls of not doing this...

• Michigan refuses to submit a plan to EPA

• Michigan’s plan does not adequately address replacement of coal-fired plants

• Michigan’s plan places unmanageable financial burdens on residents
Get agreements from utility providers that they will transition to cleaner energy sources and close old coal-powered plants.

Pitfalls of *not* doing this...

Coal plants stay open and continue to emit harmful pollutants.
Prevent passage of proposed laws to define burning coal as a “clean energy source” (Senate Bill 438 to do this was introduced by John Proos on July 1, 2015).

Pitfalls of not doing this...

Coal plants stay open and continue to emit harmful pollutants.
1. Burning coal to get electricity may seem like a good, affordable choice... but it leads to many costly and devastating impacts on human health, particularly for people of color and people with lower incomes.

2. Michigan utility companies are making progress in reducing coal-burning operations but...
   - They are *not* on track to meet the new EPA Clean Power Plan emissions limits for 203
   - State officials are *not* including the public in development of the statewide plan
   - Many utility companies have not committed to transitioning away from coal burning
   - Legislators want to include coal as a “clean” energy source

3. There are issue areas related to these problems that could be addressed by the Michigan Power to Thrive Coalition and/or its member organizations.