

## Renewable Energy Committee Meeting

July 12, 2011  
CSG Office - Iselin, NJ  
1:00 pm to 3:30 pm

Meeting called to order 1 pm

### **Regulatory Update (M. Winka)**

At the last monthly meeting, the transition for the board for the NJ Clean Energy Program structure, we said the straw proposal would be out at end of July, but it will be more like beginning of August. What we're doing with treasury's input is issuing a request for information on the RFP structure that would be out for the next structure of the Clean Energy Program. That RFP will be out more likely at the end of September. The RFI is a request for information; treasury has asked us to put out a couple of questions and see how the potential bidders would address that and then we'll have a public meeting with the stake holders in that regard, so that will move that back. That's also coordinated with the Energy Master Plan, the work group meetings for the EMP have kicked off yesterday, there were four work groups that were established by invite from the board: Clean energy funding, innovative technology, alternate fuels and biomass. Those work groups will help to fashion the questions for the EMP to be finalized. There are also public hearings that will occur at the end of July and the beginning of August. They will be held at the State house and Stockton; those dates are on the website. Our funding level for 2016 will be on the agenda for August, which will start the proceeding for the next four year funding cycle to present a recommendation to the board. Those are the activities in terms of the transition, the EMP and the funding level cycles, they're all tied together and you'll see in the RFI the outline of what that transition will look like. The straw proposal will add additional data to that, and the RFP will add additional data to that. From the RFI you should get a sense of where the board is going, and then we can start talking about that in a more public fashion, after we release the RFI. We'll probably also coordinate with the workgroup, there will be a lot of flexibility in that, there's always something going on, the EMP being revised/new funding levels/Federal funding. The key word is flexibility. You'll hear programs designed for 2012- those things may go forward, or they may need to be tweaked. I know on the energy efficiency side were already starting talking about financing programs on the multi family side; sort of ahead of the EMP to do that transition from incentives to financing and revolving loan financing programs. If you're interested in that we can send you the paper from the EE committee meeting, or come to those meetings. Any questions?

David Hill: The RFI is in August?

MW: No, hopefully by the end of the week. Our goal was to get it by the end of this week. Again, it's not a bid document; it's a request for information. We'll probably have a short time frame for the bidders to respond. We may have a follow up meeting. I think the first time we did this we sat down at a structured meeting with utilities, bidders and

talked through the process. We'd like to do the same thing, and that's taking direction from treasury. Treasury recommended it would end up in a better bid document if we took this step. It just probably adds a couple weeks to the process.

MW: On the last agenda the board approved the 3<sup>rd</sup> revision to the budget. The key issues in terms of that board order is the criteria for extensions were approved by the board. There has been some tightening down for CORE and REIP extensions, and defining the criteria for extensions. Those criteria will appear in the stipulation in front of the EDCs. However we'll talk about the EDC financing program for extensions later. We've had some requests for EDC SREC financing extensions. The board approved one; the board directed the board to go talk to the stakeholders in that proceeding and to develop criteria, similar to the criteria that were adopted in the board order for the utilities to be able to approve at least the first extension in some reasonable matter. We'll be presenting that recommendation to the board in August.

On that 3<sup>rd</sup> revision is also the 'summer promotion' for Home Performance. We're funding that with state energy program federal dollars and the large energy user pilot program compliance filing was approved. The contract amendment for TRC to actually implement the program is on the agenda for July. There's no incentive program for the next solicitation. Also on the agenda for July 14<sup>th</sup> is the energy efficiency economic filing, the stipulation was signed by the parties and there's a recommendation being made to the board in regards to those 3 programs that PSE&G is managing. It's a PSE&G filing for multi families, hospitals, and municipalities. The summary is that it's a \$105 million program over the next 2.5 years. The general impact to the rate payer is about \$25 over the 12 years of the payback of that incentive by PSE&G. Roughly. There are a lot of things that go into a filing, but that's generally about the cost.

The 7<sup>th</sup> round of solicitations for the EDC SREC Financing Program is on the board agenda. Very good results- we can't talk about them here but they'll be presented to the board for their consideration and we can issue that shortly after the board agenda meeting. NJ Natural Gas has made a filing in the EE side, and so has E-Town and we'll get those up on the website on EE's side. The other item on the agenda for the 14<sup>th</sup> is Green Cities; a few months ago the board approved contractor remediation process. Green Cities was one of the first in terms of a level 4 remediation for certain activities. This is an order to show cause that is on the agenda for the 14<sup>th</sup>.

The next upcoming meetings, are for the EMP, stakeholder meetings on ORECS, net metering and the RE committee meetings. A few things we're doing are meeting with Sustainable Jersey to do outreach on our Energy Savings Improvement Program on the energy efficiency side. We have a net metering meeting on July 22<sup>nd</sup>. We have ongoing discussions with the ACP advisory committee in terms of the proposal that we made to the ACP advisory committee. There are comments that were due Friday and we have all those comments, we'll be scheduling a follow up meeting with the ACP advisory committee to discuss there comments. The board staff will then respond to the comments and put together a final proposal to present back to the board for their consideration. That will probably be in the September time frame. We'll probably be doing the next follow

up stake holder meetings for the board directed us to talk to the utilities in terms of structure solar financing programs. Also there will be some discussion with the municipality for Solar 4 All for solar on utility poles.

Scott Hunter: Once we have a proposal for the wind rebate program, we'll have a small wind working group, probably in August or September as well.

MW: Are we still on schedule with our contract with ENREL?

SH: Yes, it's being finalized. We'll talk about it soon.

Terry S: Stakeholder meeting for SREC financing extension. Is there a date?

MW: Not yet, we're trying to put together a data matrix so everything gets reported in an apples to apples comparison. It will be circulated to utilities; they'll populate those spreadsheets and based on that we'll set up the next meeting. Our goal is to come to the board before the next solicitation with a recommendation on how to proceed in the next steps. Again, I don't know what the outcome of that will be yet. It will be a decision of the parties involved, which will include the Solar Alliance, Mid Atlantic Solar.

### **Update on status of rules re-adoption (S. Hunter)**

Chapter 8 rules in the NJ administration code were proposed for re adoption on March 30<sup>th</sup>. There were portions of solar advancement act that were special adoptions that were proposed at that time and became effective, and those provisions changed the RPS Requirement from percentage basis to gigwatt hour basis. So that proposal is now adopted and a rule. The other portions clarified some of the requirements to net metering and interconnection, primarily the milestones in interconnection. There was also long standing/ long proposed changes to the Renewable Portfolio Standard that implemented other portions of solar advancement act, they were proposed March 30<sup>th</sup> and published in a NJ register on May 2<sup>nd</sup> or so. The public comment ended July 2<sup>nd</sup>. Staff is in process of reviewing comments for developing a recommendation for the board and will probably also come out in that September time frame for adoption.

TS: With regard to comments on Ch. 8, will there be a separate stake holder meeting or discussion of those comments, and if so will that be integrated with the net metering and interconnection meeting on the 22<sup>nd</sup> or will that be something different?

SH: If we were to have another meeting or develop anything that was substantially different than what was proposed, we'd have to go back and re propose. More than likely what we're doing with this July 22<sup>nd</sup> meeting is talking about new policy issues that would have to go through the rule making process.

MW: Unless of course the comments turned into significant changes. So it's not that we're adopting what's proposed, we're looking at the comments and deciding to adopt it or not. If we did, based on the comments, decide to change, that would require us to file a re proposal.

### **2012 Program Planning (D. Hill, C. Garrison)**

David Hill: The objectives today to talk about are that, clearly, over time we're in a place where the market has moved to different levels of maturity and there are different levels of both from the SRECs and the solar market, different incentives in place and helping to generate a lot of market activity. We'll show some program updates that show the market is very active. Looking forward to 2012 the idea here is to start discussions about types of things that can add value on market value, and to identify areas that are not as active as we would like to see them. Today's discussion is to solicit some ideas that we have at the conceptual level from the Market Manager team and to solicit input from others. Scott will be talking about what we need to do in the small wind market, and we have some guest speakers as well. We will welcome written comments as well and they can be sent to Ron Reisman at [Ronald.Reisman@veic-nj.com](mailto:Ronald.Reisman@veic-nj.com)

#### Discussion topics:

What are the types of areas that are required in the market?

What are the types of activities that haven't been going on?

We would like to encourage the Bio power industry.

Small wind program: Has had some issues in terms of performance and safety. There's also been a temp hold on new apps. What are the steps we need to take on certification of equipment, as well as performance modifications?

#### Solar Topics:

##### – Metering Issues

- Educate the market on options and potential of Group Net Metering
- Community-based solar (e.g., Solar Co-ops, Solarize, etc.)
- Facilitate customer transition to new metering requirements for SREC reporting

##### – Other Solar Issues

- Should solar thermal systems be allowed to generate SRECS? If so, does this require legislation?
- Integration of RE (Eventually do you require that solar activity in NJ requires some EE work?)

##### – Training, Education and Outreach

- Solar financing seminars and realtor training
- Fire safety training, education and outreach to the firefighting community and solar industry
- Increase focus on workforce development programs and job impacts.

##### – Miscellaneous

- Support for electronic registration and processing
- Support and contribute to evaluation and documentation of impacts

Development of the market is very important and the market manager should help support the development.

New RE Funding in 2012 is 25 million, broken down between Clean Power Choice, REIP, Direct Grid supply.

Charlie Garrison: At the last meeting I presented the 2012 preliminary plan and the main message was status quo when it comes to solar, and to focus on wind/bio power. The comments were looking for would relate to that last slide that showed \$15 million available for rebates so what we'll need to decide is how to allocate that between wind, bio power, NJREMI and program management. Any other comments on today's material, is just to generate discussion.

Mike Ambrosia: Another issue to add to the list, Scott and I had a conversation that there's some concern with the relaxation of the standards for applying applications on projects that come in. There could be a lot of applications coming in that may not be real. I think revisiting what does a project have to demonstrate to get approved in the SRP is important to look at.

DH: I think there's possibly some potential there...

CG: I looked into this; I haven't seen any indication that that's happening. The scrub rates are very similar, but as you said since this started in January you wouldn't see it yet.

SH: One indication was that a registrant complained that he never registered, that's a good indicator.

MA: Yes there's more than one of those.

SH: It's also a symptom of relaxing the requirements.

George St Onge (SunShine Solar Systems): What about requiring a contract?

SH: That was an old registration requirement.

Scott Schultz (Advanced Solar Products): Some of the scrub rates that may develop might not be program traits, it could also be changes to economic reasons or SREC values.

MA: We got two this week where the customer said 'he didn't submit that on my behalf.' A related issue is we took steps in 2011 to cut back on administrative support, and I think we need to revisit and I think in Scott's mind there is a relationship between the two. We need to see what the proper way to handle that is- it could be to cut back more or add new layers back in. I think we need in the next two months to have a discussion on that topic.

SS: The other thing is to keep your eyes open because you don't require electric bills.

MA: I don't think we'll have that discussion today but I think the Honeywell team will need to work with the industry over the next few months to flesh all that out.

MA: Another issue to tee up- given that we no longer have a rebate program, REMI administratively doesn't seem to make sense we need to think through if there is there a better way to do the REMI program.

MW: Yes we're in discussions with EDA, we wanted them to just go through EDA, and we could provide an additional incentive to those customers. The portal for REMI would be the Clean Energy Manufacturing Fund.

MA: So, will we have some direction by September when they file? Should Honeywell still pursue that or would that be an EDA proposal for 2012?

MW: I think the goal was to move it to EDA as a tool in their toolbox.

SS (Advanced Solar Products): So that would go back from a customer rebate to a manufacturer rebate?

MW: Yes

SS: Do prevailing wage rules no longer apply?

MW: They would still apply.

MA: Well I don't think so if they're going to the manufacturer.

SH: There's no model that has been finalized, so it depends on the structure.

MA: My minimal understanding is that it's the entity receiving the incentive.

SH: What is the goal of the incentive? It's to encourage NJ manufactured products to be sold within NJ. So the benefit would ultimately go to for the design to the manufacturer. There has to be some linkage though as it has to be constructed in NJ, so the where the benefit ultimately lies could be question for the lawyers.

Q: You have any comment about metering requirements?

CG: We have a presentation later, so we can address that then.

Terry S: I think section around the chapter 8 re adoptions is very important. In my opinion, it proposes a lot of dramatic changes to the registration process. There has not been a lot of public discussion around it. We have to keep that re adoption in the context for discussion.

SH: We proposed the SREC requirements to be the same as last year.

Terry: But along with some other penalties, not being able to trade SRECs for a year, there are compliance issues. Yes, broadly speaking they're similar to the older requirements, but there are also some fairly significant additions to that. I think they just need to be addressed.

Angela Sehein (Corbin Solar): Why would someone apply for SRP If it wasn't a project. What would the benefit? Am I missing something?

Scott: Just hoping something will stick to the wall...maybe to

David: there's logic to your question but there's illogical thinking out there. Yes it could confuse the market, there could be a rush.

MA: I've thought that through, and I think there are two possibilities. One is fraud, the other is just someone could have had a causal conversation and just to see what would happen.

SS: Also if you have enough projects in the queue it could make you look more substantial than you actually are.

DH: Yes I would say that as the volumes grow these one offs could grow larger.

MA: Even when we required contracts there were people out there who had contracts that said sign here to have solar and sign this one to cancel when you want.

Terry S: We need to distinguish the REIP program and the SRP. It's different now than it was 12 months ago. We have to take that into consideration.

SH: The importance of the pipeline is more important than ever. It's important as a transparent indication of the amount of capacity that's going to come online.

MA: I must debate that...It gives you some info into the future, but you can never be sure of what will have to cancel or expire.

MW: Scotts point is that otherwise you don't have transparency.

MA: They'll make their own judgment calls.

Terry: If the purpose is clarity on the SREC market. If you're forcing a registration process that's too early. You're going to have, by definition more projects that are susceptible to economic fallout.

MW: I hear what you have to say, but it's more important that those unreal projects drop out, until they're closer to being real projects, because it's going to make everybody's decision up in the air. You want real data, to say, should I finance that project? Scott's point is valid and is the issue. That registration has to be transparent, and that's what our goal is.

Terry: I agree I think the process could get built in a way that doesn't achieve that goal.

Q: Is there a process in place to "clean up" that list of nonexistent projects?

MW: Yes, like I said Green Cities is one of those groups that is in that case and is on the agenda for an order to show cause.

#### Phone Questions:

Chris McDermott (Hartz Mountain): Going back to the transparency discussion on quantity and what the pipeline is looking like and what the actual installation numbers are looking like. I think a great credit for NJCEP and Charlie we've gotten more transparency on the quantity side. I think where things are still a little bit lacking is on the price side. This isn't necessarily your job to make prices transparent, but the fact is right now a 3 year strip of NJ SRECs from 2012 to 2014 goes for about \$250-\$260. My guess is that not many people out there who are still keeping their foot on the gas in this development market, realize that, or certainly the various installers and fund managers are not letting their equity, who's taking the SREC risk know that. So, whether or not you make efforts to try to make some of the longer term strip prices more transparent, is really a policy decision you have to make. I think that that level of transparency would help this SREC market become self regulating like it's supposed to be, and I don't see that happening right now. Everyone's still got their foot on the gas when some people should be putting their foot on the breaks. Just as an example, Hartz watches this very closely, and we just cancelled an 8.5 mW project because of the falloff of SREC prices. One thing you need to think about though, might be on the work of the brokers to bring some transparency on the strip prices to this market.

MW: We don't control the spot market or where those contracts are sold, or at what prices. What we can do is in the structured market, and the 7<sup>th</sup> solicitation is on the agenda, we publish the average and low price; we are talking to the EDCs, Solar Alliance, MCEIA, and the rate council about opening up that database for a little more transparency. The initial issue in that discussion was we want it to be competitive. Obviously when you have a competitive market you want to keep things close to the vest in terms of that competition and what those prices are. I think there's enough history, there's seven solicitations, there's enough process behind it to be able to open up that database and see a little more transparency behind that. I think that's one way we can provide that in the spot market. I'm open for suggestions on how to get the data, other than the exchanges that are out there.

CM: The problem is that the exchanges that are out there, Flett exchange for example, gives you the spot market price, what a current vintage SREC is worth today. What it

doesn't give you, is the strip price. So, if you want to go forward and sell 2, 3, 4 or 5 years forward; what that is trading for? There's probably about 8 brokers playing around in this market, there's also only one who actually gives any sort of regular transparency to the market on those prices, and they're located in Texas. That's the issue here. I don't think a lot of people know to what extent SREC prices have dropped, and most installers and fund managers are not telling their equity that's carrying the price risk on this, what the current state of affairs is. If you want to look at it as buyer beware- that's fine.

MW: It's a matter of your market perspective I guess.

DH: Another we discussed was the potential for long term pricing to be voluntary reporting. We also suggested SREC pricing to be available. As Mike was saying we don't want to disclose specific prices.

MA: That raises about 10 red flags in my mind. It might be best to let the market figure this one out.

DH: I would lay out a structure that it is what it is. It's not over specifying, but it's allowing and if the market reacts in that way, then it's not going to be more information and that's what we've got.

SH: Solar thermal, do you mean high temperature or low?

DH: Not electricity.

SH: We've gotten two requests, whether solar thermal electric producing technologies are eligible for SRECs, and we usually only get one a year. This is a regulatory question, it doesn't require legislation. Solar thermal that produces electricity is a class one renewable resource. But, our SREC regulations don't say that it has to be in photovoltaics. Historically, all of our forms, we've always assumed that its photovoltaic's. But the board has not said that publicly, so we'll be raising that in the July 22<sup>nd</sup> meeting. Also, there are vendors claim its technologically feasible and they're planning on doing it in NJ.

DH: I put it on for low temperature for water heating because I think it's under utilized resource in general in NJ.

MW: There was a bill that just talked about that. The board did support it, but the bill also was short in being able to convert bpu's to electricity. I don't know if that bill will come up in the next session; the legislature is out until the end of the summer.

AS (Corbin): If the pipeline is so important, is there a way to just get the cancelled ones out of the system, instead of waiting a year.

CG: Well, we do encourage that customers let us know they've cancelled and then we'll cancel it. The other issue is if they expire...

AS: one year later!

CG: Well they have a year to build, so that's why if someone knows 3 months later after they've been approved that they can't do it. They should cancel it and let us know.

MA: Should there be demonstration of progress steps to stay on?

AS: In PA, you have to stay with one installer.

TG: Customers can change installers in this program if they're not happy with the current one.



GSO: Is there any financing from the EDCs for the latter part of this year for the loan programs?

MW: There's the next solicitation. Also like I said, there's ongoing discussion which we're hopeful will bring a recommendation to board before that last solicitation- depending the time frame, obviously it's going to be a negotiated stipulation, rate council's involved, the rate council and MCEIA is involved. Those things don't happen overnight, even if we agreed today the negotiation takes some amount of time. You can talk to your association; they're a party to that stipulation, so you should be asking them where they are in that process.

MW: The next step said the time frame. We're talking about an overview. August committee meeting will have an overview. End of August we'll have a draft plan. September committee meeting we'll go over draft plan for the draft compliance filing. September there will be a final draft submitted to BPU based on your input. We will then schedule in October a public hearing on that final draft. Based on the comments we'll work with market manager and program coordinator to finalize it and circulate that in November, and the board recommendations would be in December. Mike will work together a schedule for all of that.

### **2011 Program Update (C. Garrison)**

The preliminary installed solar capacity as of 6/30/11 is 380 MW.

The preliminary solar capacity project pipeline as of 6/30/11 is over 440 MW.

#### **New Extension Process:**

Projects that have NOT received an extension may be eligible for only one extension and must provide documentation to demonstrate the following items:

- Engineering and design work has been completed.
- Construction permits have been approved by the authority having jurisdiction (where applicable).
- Project materials including the panels, inverters and mounting system are on site.

If approved, the extension will be granted as follows:

- Projects  $<$  or  $=$  10.0 kW will be eligible for a 4 month extension
- Projects  $>$  10.0 kW will be eligible for a 6 month extension.
- NO additional extensions will be granted.

Public projects  $>$  10.0 kW that have already received one extension may be eligible for only one additional extension and must provide documentation to demonstrate the following items:

- Engineering and design work has been completed.
- Construction permits have been approved by the authority having jurisdiction (where applicable).
- Project materials including the panels, inverters and mounting system are on site.

- The system must be substantially installed and awaiting final interconnection approval or in the startup and testing phase.
- If approved, a final extension will be granted for a period of 6 months from the current project expiration date.

Private sector projects and public projects less than 10.0 kW are not eligible for a 2<sup>nd</sup> extension through the Market Manager.

### **SREC Meter Location:**

#### Behind The Meter Systems

- The SREC generation meter must be installed on the side of the transformer that is directly serving the building load.

#### Grid Supply Systems

- The SREC generation meter must be installed on the side of the transformer that matches the grid voltage at the point of interconnection.

\*\*In both cases the transformer losses must be excluded from the SREC generation.

Thirza Jacobus (PSE&G): Will the factor that you mentioned before be established for new projects before certification?

CG: I will go into a slide on how we will propose to handle this but yes, it will be part of the application process. It's something that we will need with the final as built paperwork. When we give our information to GATS we be letting GATS know that there's n adjustment.

How to net out losses; we have a system meter monitoring worksheet. We're going to amend that sheet to add:

- Transformer make and model
- Specifications showing the transformer loss at different load conditions (25, 50, 75 and 100%)

We will work with the OCE on how to come up with that formula. We'll provide that information to GATS, and you will ultimately tell us that factor and the back up. When you update your GATS reading, you'll report this new generation to GATS.

Q: This is for new projects?

CG: This is for all projects to be eligible to generate SRECs

Q: So existing systems will have to retrofit?

CG: They'll have to use the adjustment factor. This is a pretty rare case, I don't think we've seen more than 10 or 12 of these.

DH: We're not saying you have to do this for every project

CG: This is for a lot of larger behind the meter projects.

Q: So we're not talking about the residential, existing homeowners?

Joanne Bachmann: Are you talking about the rule adoption about retrofitting meters?

Q: David had a comment in his presentation about retroactively requiring existing systems to have meters I thought.

CG: That is not erroneous, that is true, it is in the rule re adoption.

DH: I was suggesting that one of our roles would be to support consumer information on what the new requirements are for new meters.

Q: And when does that happen?

CG: Six months after the rules have been formally adopted you need to have an SREC meter in place or you will no longer be able to get SRECs.

SS: So if you were under 10kw you didn't need a meter, does that change then?

CG: Yes this rule eliminates estimated meter readings 6 months after rule re adoption. So roughly by March of 2012 all readings must be from a revenue grade meter. If you look back at the history of this program, in 2007, when the SREC or pilot program began, you needed to have a meter. SRP always had that requirement, regardless of size, this was always in the workings.

SS: Not questioning that, what I am questioning is that there has been a lot of changes in installers, will you send out notification to the consumers who have solar installations about this.

CG: Yes that will be critical in 2012 on how to go about this, whether it's notification, whether it's facilitating finding companies that will install these meters, some installers may be long gone. That all remains to be seen, we will work with the OCE and see what support we should provide. And certainly the industry should be thinking about what they can provide as well. There are some installers out there that could cost effectively install meters. So if the installer is no longer in the picture, there's no reason why that customer can't go to another installer.

SS: Yes, or any electrician can do it.

Q: What kind of meters?

CG: Revenue grade ANCI c12

TJ: For existing systems that may fall into this, will you accept the system metering/motoring worksheet, once it's amended, can they just simply submit that form?

CG: Yes we want the installers to use the worksheet.

TJ: And the market manager will notify GATS of what the meter is? Or the factor?

CG: Correct. Our objective is to set up what the formula is, but not to be involved in deriving the fact that we want the installers to use the formula to provide the transformer tech sheet that we can verify that it's correct and then we can provide that to GATS.

MA: Also David, we need to add that to the list, what will be the QA/QC to find out if they've installed a meter.

SS: They have to provide the pictures as well.

CG: We do have REC verification audits.

MA: It could just be random inspections. It could be documentation and inspection. I think we just need to think about what we're going to do, if anything.

TJ: Is PJM going to modify the schedule A document?

CG: They're leaving it up to each state to enforce how they apply the multiplier. Our part of this is just to provide the information to GATS. I don't know how they're going to verify, but they will be aware that they need to have an adjustment factor.

GSO: We added over 40 mW of in the last month?

CG: Yes it was just under 41.

GSO: How many were mega projects?

CG: I think I counted at least a dozen or more that were over a megawatt. Maybe even 20.

TJ: Is the timeline for this the same as the residential meters?

CG: The timeline for the metering adjustment factor has always been in effect. It's something that we became aware of just in our interactions with GATS. We were under the assumption that the developers were just working this out with GATS since it was in the GATS rules, but we came to find out that they weren't doing that and they wanted each state to do that, so technically this needs to be done for every project retroactively. We know of about 5 or 6 that this applies to and we've been working with them and we all felt it was a reasonable method.

Fred Halbert: The gist of what I heard is that this meter has to be installed close to the point of interconnection?

CG: Yes, as well as the level of service being provided to the building or to the grid.

Dennis Wilson (Renewable Power Inc.): Do you know how many meters are "missing" or are operating without meters?

CG: To quantify it? I don't know, but it's in the thousands. Many installers have been putting a meter even if it wasn't required. The industry can quantify it better than we can, you can look at all the old CORE projects and know that they didn't require a meter, but most of the large ones had meters.

CM (Hartz): There may be a small implementation issue with this transformer issue for grid side of the meter connected projects. Our experience thus far in grid supply projects, is that we as the developer/owner are not responsible for uploading generation data to GATS. It happens automatically through the generation meter that sends data to PJM real time settlements and PJM internally sends the data to GATS. So, the developer/owner does not touch the data to actually do any sort of adjustment related to the transformer. So that's something you may need to work on with PJM on actually how you do that when who you're asking to make the adjustment on the grid side of the meter connected system is not actually involved in the SREC issuance process.

CG: I stated it would be the SRECs owner responsibility, so hopefully that will get to the right person.

CM: The problem is that, the SREC owner owns and operates the system, but all the data related to SREC issuance is out of the owner's hands. I've circled around with Jackie on this. This is actually pretty byzantine; it's how the data gets from PJM settlements to PJM GATS is governed through a confidential internal agreement between the two organizations. It's not that clear and it took me some digging to find out how the RECs get issued and the owner does not touch any of the data. The owner can't do anything.

CG: The information I gave came from Jaclyn so she is asking the state to come up with a process to make sure those adjustments get provided before they get inputted to GATS.,

CM: She may not have specified between the behind the meter and the grid side of the meter connected systems, because like I said if it's the grid side of the meter the issuance process is completely different.

SH: This is not just an issue for grid supply projects. RECs are created from that not self reported meter readings.

SS: Any updates on group net metering?

CG: We'll talk about it at that July 22<sup>nd</sup> net metering & interconnection meeting in Trenton.

## **2011 Operations Update (T. Gray)**

There were 660 applications received in June. As of last week we received 245 applications in July.

In June we also received 583 Final As-built paperwork packages. In July received 224 packages.

Processing time: SRP 3-4 weeks and rebated 5-6 weeks for cert #s, for projects with completed paperwork.

SH: The March/April/May – have they received their GATS certification numbers?

TG: Yes most of them if they had the final paperwork in and the inspection has passed and we have the EDC. This is just final as-built paperwork received.

SH: I get phone calls from people who say they completed their projects 3 months ago and don't have certification numbers.

CG: In that case it's not a processing time issue on our end, it's most likely missing paperwork.

AS: I thought we had to hand everything in all at once?

TG: Well we have said clearly that you have to hand in everything except the EDC notification because the EDC's were trying to get their own process in place. We have seen an increase in the EDC notifications that come through. It appears that there is definitely a process in place, and we definitely see the increase on our end.

AS: I'm not saying all of them, but I don't see that there is a process yet.

John Teague: We'll talk about that later after Tammy.

CG: Angela let me just point out, we didn't want any projects to expire while waiting for the EDC notification, so that was the one exception to handing in your final as-built paperwork. Also, I think all installers should remind their customers that those SRECs can be carried over into the next two energy years after the energy year in which they were generated.

SH: Assuming those 1,000 projects submitted all their materials together, what is the processing time for it?

TG: So typically when the final as built comes in within a week it goes into the inspection or the waiver process. We will have an inspection scheduled or a waiver letter sent out to them within 2 weeks. At that point we allow 10 days for an inspection report to come back. There's a QA review process that takes a little while before the waiver

letter goes out. Then depending on if it's non rebated or rebated it's about 4-6 weeks. We are definitely on track with those timelines. Keep in mind that we're in the middle of funding two of last year that's ending. There were a lot approved through mid August that are expiring now, and September started funding cycle 3. We process a lot more SRP's, but there's a lot of rebated still. Next time I'll start breaking it down between SRP and REIP.

CG: Yes rebated projects take a lot longer because there's a dollar amount involved and there's a lot more to check.

TG: Again, we got 660 applications in; we approved 707 projects with 69 mW. 565 were residential, 106 were commercial, and 36 were public and farms. We also sent out 476 NJ Certification numbers in June. Approvals we are close to 4,000 for the year and close to 2,500 for NJ Certifications.

SS: So 111 MW that have been installed and certified since the beginning of the year?

TG: Correct.

#### ESFI Eligibility Timelines:

Old Timeline: Jan 1 – Dec 31, 2011

New Timeline: Jan 1- June 10, 2011

Luke Uzupis (Amped on Solar): So about ESFI, does that mean that we should not expect to see any more opportunities for rebates in the next year?

SH: It wasn't a rebate, it was an incentive for people to participate in the EDC Financing Program. There's no incentive needed for solar, other than SRECs and net metering.

LU: Thanks, I understand

David Well (SLG Capital): We've had some projects that take 6 weeks are longer to get the meter swapped for the bidirectional meters, and that is when SRECS start accruing. Yet we've had revenue grade meters on the site already that we could use to record SRECs before that. Is there any way to speed up that process, or getting those SRECs approved faster? During the summer, 6 weeks can have a substantial impact.

SH: That's not true. SREC creation starts the date the EDC gives authorization to energize. And they are authorizing to energize before the meter change out. However some don't couple, JCPL does not couple, ACE swaps out within 20 days. We'll be talking about that soon in the agenda though.

DW: Talking about PSE&G territory.

CG: Item 8 on the agenda we will talk about that so you can bring it up again.

MW: I heard the PSE&G stayed pretty much on schedule though.

#### **Report on Biomass Potential (D. Specca)**

Dave Specca from the Rutgers Eco Development outlined a NJ's biomass potential using a report done for the BPU in 2007.

## Research yielded six major findings about New Jersey's biomass resources:

1. New Jersey produces an estimated 8.2 million dry tons (MDT) of biomass<sup>1</sup> annually.
2. Screening process developed to estimate practically recoverable biomass. Approximately 5.5 MDT (~65%) of New Jersey's biomass could ultimately be available to produce bio energy.
3. Almost 75% of New Jersey's biomass resources produced directly by state's population, majority in solid waste (e.g., municipal waste). Biomass concentrated in central and northeastern counties.
4. Agriculture and forestry management also important potential sources of biomass, account for majority of remaining amount.
5. New Jersey's estimated practically recoverable biomass resource of **5.5 MDT** could deliver up to **1,124 MW of power**, (~9% of New Jersey's electricity consumption) or **311 million gallons of gasoline equivalent** (~5% of transportation fuel consumed) if appropriate technologies and infrastructure were in place.
6. Large proportion of waste - based biomass supports recommendation that New Jersey pursue development of an energy from waste industry.

A range of biomass resources were examined; these were divided into 5 categories based on physical characteristics.

- Sugar/ Starches
- Lignocellulosic Biomass
- Bio-oils
- Solid Wastes
- Other Wastes

A screening process was developed to estimate how much of New Jersey's theoretically available biomass might be recoverable. The results indicate that approximately 5.5 MDT (~65%) of New Jersey's biomass could ultimately be available to produce energy, in the form of power, heat, or fuels.

Almost 75% of New Jersey's biomass resource is produced directly by the state's population, much of it in the form of municipal solid waste.

An early part of the project design was to identify the leading biomass to energy conversion technologies that should be evaluated. Considerations for this analysis included:

- Technical feasibility/niche applications
- Compatibility with New Jersey biomass
- Focused on broad technology platforms with similar characteristics
- Market Readiness scale

The decision to screen out specific technologies for the current analysis does not mean that it will not find some application in New Jersey in the future.

By 2010 and 2015, cost reduction potential should bring additional biopower technologies into the realm of commercial application.

A unique Bio energy Calculator and interactive biomass resource database was developed to aggregate all biomass and technology information. This database contains a number of important features:

- Detailed biomass resource data, by county, for more than 40 biomass resources.
- Energy generation data for 13 bio energy technologies that takes into consideration advances in energy output and efficiency over time.
- The database was designed to analyze the biomass resource data and technology assessment data in an interactive fashion. The database is:
  - Structured by county and resource type
  - Contains technology performance estimates to convert biomass quantities into energy (electricity and fuel) potential.
- The Bio energy Calculator yields projected bio power and bio fuel estimates for 2007, 2010, 2015, 2020.
- The database allows for continual updating as additional data is collected and refined.
- A screening tool is imbedded in the database to conduct sensitivity analyses on the estimate of recoverable biomass.

Full Bio energy Assessment Report and Bio energy Calculator is available online at:

<http://njaes.rutgers.edu/bioenergy>

#### Contact Information

David Specca

Assistant Director, Rutgers EcoComplex

1200 Florence Columbus Road

Bordentown, NJ 08505

609 - 499 - 3600 x226

specca@aesop.rutgers.edu

Questions/Comments:

CG: Since this was done in 2007, has there been an analysis of how much of NJ's power is bio fuel? Are there projects that may not have come through us?

DS: I think you would have seen all of them because of the incentives that are available.

CG: Who is our competition for these projects?

DS: With regard to some of the wood waste that is generated in the state, Pennsylvania is using the wood waste to generate electricity at a couple of facilities. Landfill gasses are predominately being used to make electricity in state, but as certain projects come offline or on line there's opportunity to do other things with that.

CG: Is there a place you would recommend to do some follow up research on that?

Where it's been tracked? Is there a list of projects and where that biomass is going?

That's something as we go through this whole process of trying to see why we're not hitting the goals we want to see in bio power, what is our competition?

DS: Yes we could help pool that info together.



Audience Question: There are 90 million projects in NJ for bio power?

DS: Yes.

Joanne Bachmann: Are they grid supply?

DS: No, behind the meter. One by the baseball stadium, one by a hospital, etc.

Audience Question: How many tons of waste are we talking about for those projects?

DS: 40k-50k tons, micro plants, it's really about the distance. They already have the food and waste under contract in most cases.

JB: Are they making electricity? Do they not know about our program?

DS: No they're just getting online now. Most are getting the local approvals and the policy of solid waste.

DH: I think we would encourage those applications to be submitted while some of that started to happen.

Ron Reisman: We also fund the feasibility studies themselves.

DS: A lot of these guys who got into the game who don't have the long term ability to deal with the waste. Their challenge is finding a site that's politically acceptable. We've had to fly officials out to Europe.

Audience Question: How much waste is going to composting?

DS: I'm not sure, even though some of that info is confidential. There was a facility in Woodbridge that was taking it, but has since shut down.

Audience Question: In terms of project size, what do they have to be to be viable?

DS: In terms of project cost?

Audience Question: Right, in terms of project size when does the cost make sense?

DS: It comes back to the technology type but if you're talking about an anaerobic digester farm perhaps, you'll often have about 500 cals or more to be economical. There's a good combination of manure and food waste. There's a large horse industry in the state and large food processing industry we think there's a really good fit there because you get more gas produced when you mix the two together. Those projects are \$2-4 million, for equipment, just for the digester not counting the pre-processing and the handling the compost that comes out. On dairy farms, the strategy is now involving a 3<sup>rd</sup> party coming in to do that for the farmer. These companies basically have a packaged plan and would come to the farm with it.

DS: One idea that is below the bar is coke firing with Coal, which is being done with other states. It is an interesting idea because the coal plant uses this as a supplement that goes into the grinder for the coal if they do it at a very low rate, that's like 2% to a maximum of 5% of the fuel going in, but what I believe may make sense for NJ is to actually have a gasification plant next to a coal plant that produces syn-gas that would then go into the coal fired boiler. The reason for that is because then the ash that's generated by the biomass can then be reapplied to fields or other things, whereas if that ash is mixed with the coal ash it then becomes something we handle as coal waste and then there's also issues that if you put biomass into the boiler it tends to be a little lighter in weight so the ash that comes from it will go into the bag house and that can create some problems too. There are issues that have to be analyzed, but because of the attractive price to get into that type of biomass power it could be something NJ should

consider, even though we have a very limited amount of coal plants but it does fit into the strategy.

SH: Do you have any ideas on how we can do that without allowing the other states to get the subsidies? The analog for solar is we require connection to the distribution system in NJ because the ratepayers are paying that benefit to be connected. What would be the analog for bio mass coal firing, are there any local environmental benefits?

DS: It does reduce the amount of sulfur that comes from the plant. In addition to the carbon that's generated from the bio mass is carbon neutral so the overall carbon emissions from the plant would be lower too, and then also potentially cheaper than coal itself.

SH: If we were to call biomass coke firing a class 1 Renewable, we'd have to allow it all throughout PJM, and the REC value would suddenly be \$3 or \$2, something that's not very contract worthy.

DS: Yes these are things to consider that I'm not familiar with, but one advantage of a coal plant is that if they don't have enough biomass on a given day, they could put more coal in the system to keep their output where they want it to be and while the biomass industry is young and still developing, there will be times when you may not have all the materials on a given day. They really depend on that biomass coming in every day. We would certainly be happy to sit down and talk about it.

CG: I think we'd like to keep this going every other meeting.

### **Update on status of REIP Small Wind Program (S. Hunter)**

To summarize, back in March, a turbine blade came off a wind turbine. When that occurred we put a hold on the wind program. We also learned of a wind turbine that caught on fire earlier to that. We're in the process of commissioning a study for a forensic study of these issues. Subsequent to that hold we held a small wind working group to insure this doesn't happen in the future. The customer who put that turbine up has not taken it down still. We're trying to come up with program design changes that will prevent this in the future. We had about 30 projects were waiting for rebates when this happened; the Market Manager contacted industry stakeholders to clear seven of the ten turbines manufacturers. Of the three turbines that did not pass the clearance, two are turbines that had issues, and the third was a Chinese manufacturer that had very limited operation history.

MA: Due to lack of response? Or just evaluating?

SH: No just the situation.

MA: They're turning all the information you asked for over?

SH: Yes.

SH: We're working with the department of community affairs who manages the local code inspections for structure throughout the state to enable the projects that we have to go forward based upon local code inspection sign off. Once that occurs we can lift the hold on projects that have rebate commitments. There are about 10 projects under those 3 manufacturers. The small wind working group put out a request for ideas on how to

change the program. We got those comments and we're putting them into a straw proposal that we'll discuss at a future wind working group before taking a proposal back to the board. That meeting will be in August/September time frame after the straw proposal is out.

Frank Dewitt: Are we still not opening the program until the investigation is done?

SH: Towards the end of the year the investigation will be done around the same time as the hold will be lifted.

FD: So for those of us that sell wind, will the program eventually be open again? Can we still sell?

SH: We expect it reopen.

MW: Our goal is to have a wind program under REIP. The study by Enrel may help to inform further issues, but our position has always been to get to the bottom of the issues we want to address, we got those comments back and we're working with the market manager to put together a straw proposal that we said we would circulate back to the community before we finalize that.

SH: We're working on a 2012 program plan right now. It will not be going away just yet. 2013 to 2016 is still to be decided though.

Q: Any timeline on Enrel contract?

MW: Not yet, the issue is that treasury is taking a look at the terms and conditions of the contract. We can bug them as much as we want but there's no timeline. Enrel can only enter into a contract with their terms and conditions. It's a minor thing but we didn't expect it. We're close though.

### **Update on Interconnection Issues (J. Teague and C. Garrison)**

Last month we had a meeting in Newark, June 10<sup>th</sup>, and prior to that the director of the interconnection program for JCP&L came into NJ and for 3 days he reorganized his group and did trainings. We now have on our website the contacts for counties in southern Jersey and northern Jersey. I asked Tom Dinatio to speak about JCP&L and Josh Cataray for ACE. They were going to talk about the improvements. Then Angela from Corbin Solar to let us know if anything has changed.

Tom: We have two new points of contact and they handle and coordinate new applications as they come in. As part of that whole process we had a large backlog and that meant they addressed it with more employees- about 20 employees work full time on the process. The backlog was at about 1,500 applications, and now is down to about 600 and many of those could be duplicates or already approved. Other things done, we redesigned the website with contacts and a specific email address for questions. Also we have streamlined process for bidirectional meters. We now call for meter change outs on the level 1 applications when they receive their approval to construct because it's faster. We've also revamped some of our email communications and have two people to answer escalated complaints that are ongoing. Some statistics- we have 100 outgoing emails a day of authorizations to construct or to operate. We hope to have all backlog gone by August 1<sup>st</sup> and be in a status quo position by that point.

Josh: At the end of may have increased staff by 50%. We are working on cross training with our GPC South team that does PEPCO Maryland and PEPCO DC. We have also been working on a lot of our process issues and streamlining applications. We're going to be heading towards a more electronic process, and sending out more email notifications which we've already started to do, just trying to automate things. Our communications with our internal department for approval, we're working on streamlining those departments so they can give us answers on that process. All of these are works in progress. Trying to get backlog to go down and be smaller in the next few months

Angela Sehein: About 5 or 6 weeks ago we had customers calling us saying that meters have been changed out, but we didn't send any paperwork out. So I guess they are changing meters based on preliminary applications. We're still not seeing the paperwork, "permission to operate" within 20 business days.

GSO: We've called JCP&L and not an email or phone call back.

AS: We're just looking for a clear, concise process. So when JCP&L or any of the other utilities aren't complying we know what the next steps are. I know we've been going to John.

RR: Well we have Tom on the line, Tom can you address Angela and George's comments?

Tom: We would need to know specifics like when it was submitted about why it wouldn't have been done in 20 days.

AS: We saw an influx of repeat paperwork, where we had received the permission to operate, and then got it again, but it listed two different dates.

Tom: There may have been some duplicates because when the email database was done in a different location, it was basically dumped there were about 1,000 that may have been done a second time, obviously unbeknownst to us, but we don't know that until a later time.

AS: So moving fwd, what is the process? What do we do if something is not done in 10 or 20 days?

Tom: Hypothetically? Or new?

AS: New

Tom: They should be good going forward, they should adhere.

AS: Ok so we'll track then.

Jim Mcleer (Solar Electric NJ): What about ACE?

Josh: Yes its difficult to say, sometimes they're on the phone all day long due to the issues, so they can't get to paperwork. We've hired additional clerical help to hopefully curb phone calls and take messages.

JM: All I want to know is when do I start to complain? When I send in an application, when is it too long and I need to say something?

SH: The net metering rules are set by the net metering and interconnection regulations.

JM: No one knows the rules

SH: No, the EDCs know the rules. 20 days is the authorization to energize for level one. Josh, how quickly should they submit their complaint based upon the application dates?

Josh: It's up to them, honestly.

SH: So then you go by the rules.

AS: Where do we put our complaints?

SH: We're in the process of putting together an online complaint form. Until then, the EDC and copy John Teague.

AS: By email?

JT: Just what you've been doing, send it to staff. Also we're working on the complaint form that Charlie has an update on.

CG: There will be an interconnection and net metering complaint form on the website. We'll put one on the renewable energy program landing page and one on the page where we list the EDC and interconnection contact page. You will have had to notify your EDC about the problem and give them time to address it. You may want to weigh the cost of sending an email which will make the processing time slower. If you do decide to enter your complaint though, you would then put your info in on the website form.

SH: What's the status of finalizing the database of complaints received John so far?

JT: We ought to have it in the next week.

SH: The process that Charlie described is designed to supersede what John's been doing. The complaints come in all different formats. So this is designed to make it more transparent and make it one central format.

MW: In terms of timeline, the only timeline in the rules is 20 days.

SH: No, there's timelines for each level of interconnection, and for the turnaround for authorization to construct. The rules as they exist now are not exactly clear about when the authorization to energize must be delivered. A sane, rational person could say 20 days for level 1 interconnection. There's other places in the rules where there are compromises and flexibility that's causing all of this. The EDC's can inspect or they don't have to inspect, and these contingencies are causing the lack of clarity.

MW: So because we built in flexibility, there's not a firm, hard date? So we'll put a time frame in there? That doesn't make sense. The 20 people they added will come down to a rate issue.

SH: The rule proposal clarifies a lot of this.

JM: JCP&L added 20 more people, ACE added 50% more, what is 50% more staff equal?

Josh: Now we have 3 people now.

### **Upcoming events**

- a) Energy Master Plan public hearings  
*July 26 (Newark), August 3 (Trenton), August 11 (Pomona)*
- b) Stakeholder meetings on rulemaking for OREC funding mechanism  
*July 19, August 1, August 16 (all in Trenton)*
- c) Net Metering and Interconnection Stakeholders Meeting  
*July 22 (Trenton)*
- d) RE Committee meeting schedule for next several months  
*August 9, September 13, October 11 (all in Iselin)*

Meeting Adjourned at 3:52 pm

# RUTGERS

New Jersey Agricultural  
Experiment Station



## ASSESSMENT OF BIOMASS ENERGY POTENTIAL IN NEW JERSEY



Prepared for: The New Jersey Board of Public Utilities

**July 2007**

Prepared by: The New Jersey Agricultural Experiment Station

**NJAES Report 2007-1**

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### Executive Summary

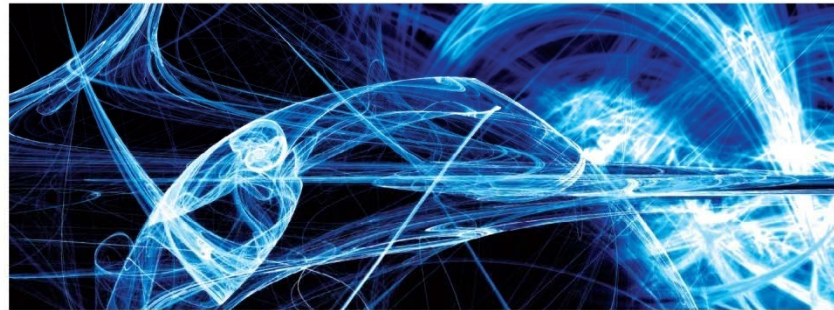


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## Executive Summary

**In September 2006, the New Jersey Board of Public Utilities retained the New Jersey Agricultural Experiment Station to evaluate the state's bioenergy potential.**

- The four major goals of this project were to:
  - Assess the characteristics and quantity of New Jersey's biomass resources;
  - Assess technologies (commercially or near commercially available) that are capable of producing bioenergy, in the form of electric power and transportation fuels from New Jersey's biomass resources;
  - Develop the first statewide mapping of waste/biomass resources and bioenergy potential;
  - Develop policy recommendations for moving New Jersey into the forefront of bioenergy innovation.
- These deliverables will result in the establishment of an outstanding foundation upon which to develop the bioenergy potential for New Jersey.



## Study Team

- **Project Director** – Margaret Brennan
- **Waste Stream/Biomass Assessment**
  - *Team Members:* Brian Schilling (Team Leader), Priscilla Hayes (Co-Leader), Zane Helsel, Kevin Sullivan, Mike Westendorf, Dave Specca, Stacy Bonos, Jacqueline Melillo, Bob Simkins (Burlington County Solid Waste Office)
- **Bioconversion Technology Assessment Team**
  - *Team Members:* David Specca (Team leader), Steve Paul (Princeton University), Bob Simkins (Burlington County Solid Waste Office), Jacqueline Melillo, A.J. Both, Donna Fennell, Rhea Brekke (NJ CAT)
- **Waste Stream/Biomass Mapping**
  - *Team Members:* David Tulloch (Team Leader), Caroline Phillipuk
- **Policy Recommendations**
  - *Team Members:* Margaret Brennan (Team Leader), all members of project teams
- **Navigant Consulting**
  - Provided technology cost and performance data; developed interactive database with information and functionality specifications provided by NJAES.

**Research yielded six major findings about New Jersey's biomass resources:**

1. New Jersey produces an estimated 8.2 million dry tons (MDT) of biomass<sup>1</sup> annually.
2. Screening process developed to estimate practically recoverable biomass. Approximately 5.5 MDT (~65%) of New Jersey's biomass could ultimately be available to produce bioenergy.
3. Almost 75% of New Jersey's biomass resources produced directly by state's population, majority in solid waste (e.g., municipal waste). Biomass concentrated in central and northeastern counties.
4. Agriculture and forestry management also important potential sources of biomass, account for majority of remaining amount.
5. New Jersey's estimated practically recoverable biomass resource of **5.5 MDT** could deliver up to **1,124 MW of power**, (~9% of New Jersey's electricity consumption) or **311 million gallons of gasoline equivalent** (~5% of transportation fuel consumed) if appropriate technologies and infrastructure were in place.
6. Large proportion of waste-based biomass supports recommendation that New Jersey pursue development of an energy from waste industry.

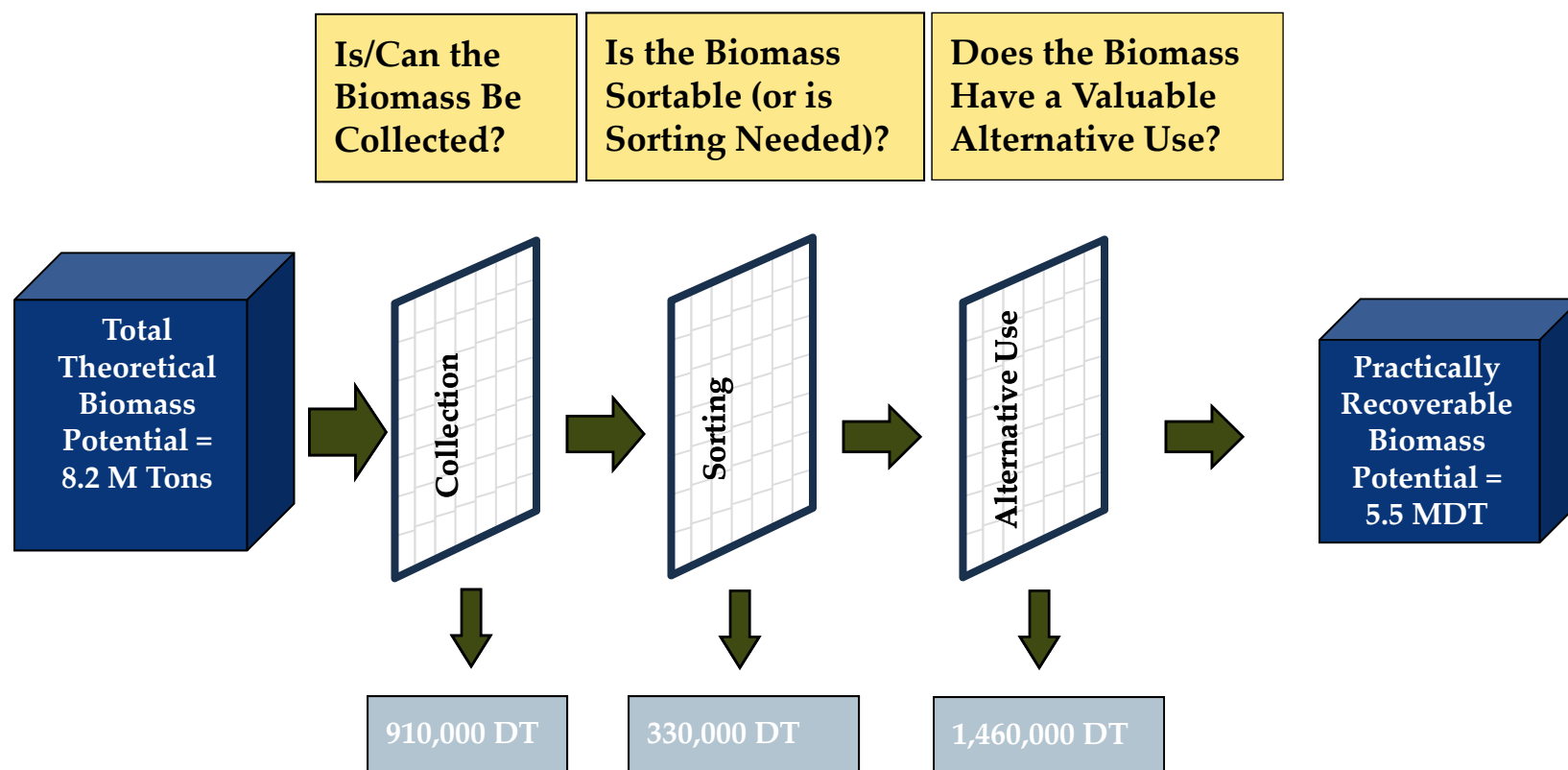
1. This total includes biogas and landfill gas quantities converted to dry ton equivalents on an energy basis. This does NOT include biomass that is currently used for incineration or sewage sludge because these are not classified as Class I renewable feedstocks in NJ.

**A range of biomass resources were examined; these were divided into 5 categories based on physical characteristics.**

Feedstock Type	Definitions	Resources
<b>Sugars/Starches</b>	Traditional agricultural crops suitable for fermentation using 1 <sup>st</sup> generation technologies Some food processing residues are sugar and starch materials	<ul style="list-style-type: none"> <li>• Agricultural crops (sugars/starches)</li> <li>• Food processing residues (w/residual sugars)</li> </ul>
<b>Lignocellulosic Biomass</b>	Clean woody and herbaceous materials from a variety of sources Includes clean urban biomass that is generally collected separately from the municipal waste stream (wood from the urban forest, yard waste, used pallets)	<ul style="list-style-type: none"> <li>• Agricultural residues</li> <li>• Cellulosic energy crops</li> <li>• Food processing residues</li> <li>• Forest residues, mill residues</li> <li>• Urban wood wastes</li> <li>• Yard wastes</li> </ul>
<b>Bio-oils</b>	Traditional edible oil crops and waste oils suitable for conversion to biodiesel	<ul style="list-style-type: none"> <li>• Agricultural crops (beans/oils)</li> <li>• Waste oils/fats/grease</li> </ul>
<b>Solid Wastes</b>	Primarily lignocellulosic biomass, but that may be contaminated (e.g., C&D wood) or co-mingled with other biomass types	<ul style="list-style-type: none"> <li>• Municipal solid waste (biomass component)</li> <li>• Construction &amp; Demolition (C&amp;D) wood</li> <li>• Food wastes</li> <li>• Non-recycled paper</li> <li>• Recycled materials</li> </ul>
<b>Other Wastes</b>	Other biomass wastes that are generally separate from the solid waste stream Includes biogas and landfill gas	<ul style="list-style-type: none"> <li>• Animal waste (farm)</li> <li>• Wastewater treatment biogas</li> <li>• Landfill gas</li> </ul>

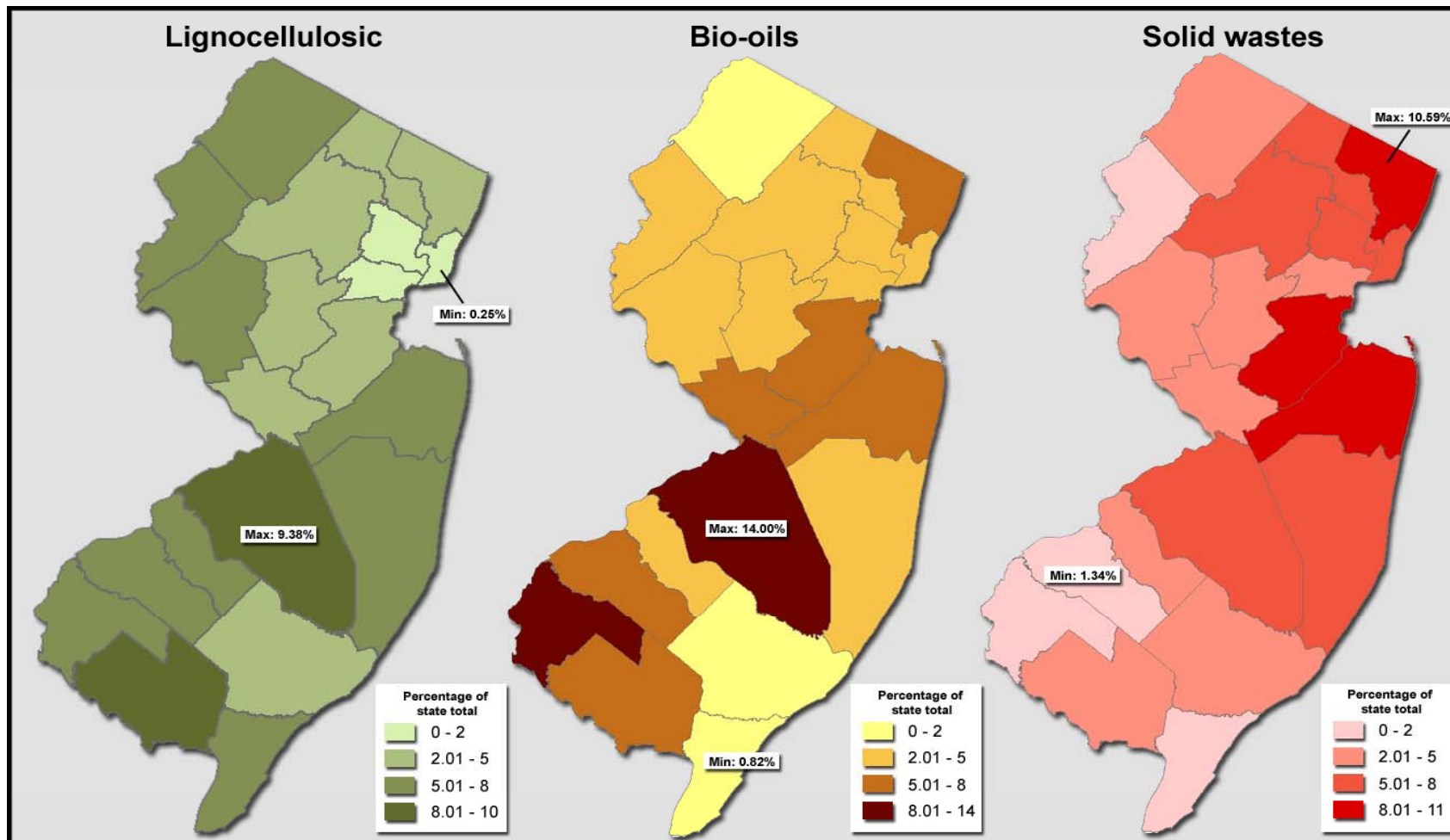
**Biomass Supply Analysis » Practically Recoverable Biomass**

A screening process was developed to estimate how much of New Jersey's theoretically available biomass might be recoverable. The results indicate that approximately 5.5 MDT (~65%) of New Jersey's biomass could ultimately be available to produce energy, in the form of power, heat, or fuels.



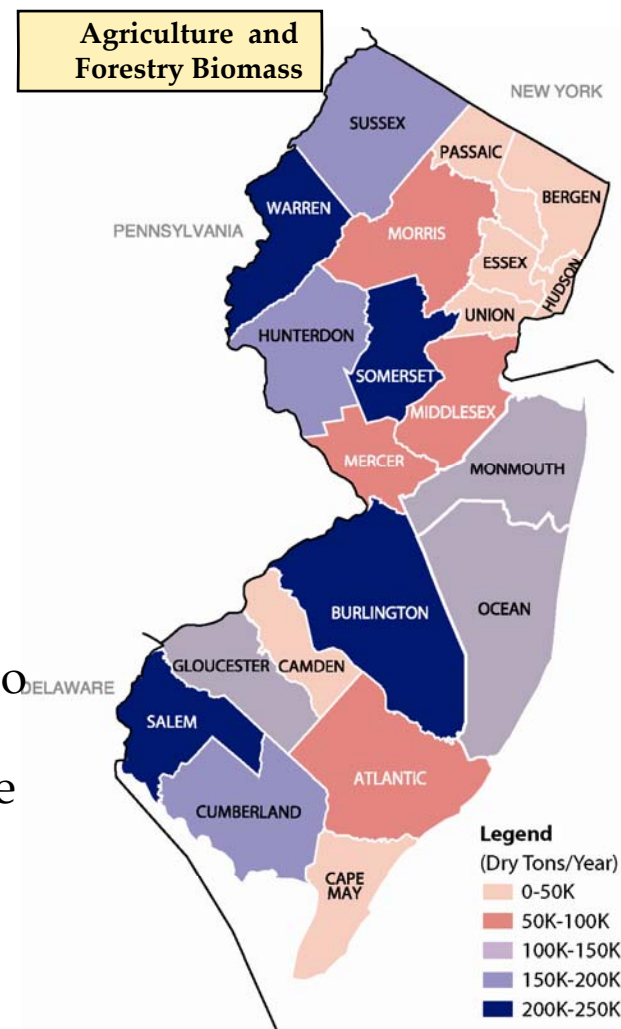
*Note:* This screening process is preliminary and would require considerably more analysis to reach any final conclusions. The screening analysis has been incorporated into the database, and provide flexible "scenario analysis" capabilities for the user.

## Biomass Resources by Feedstock Category 2007



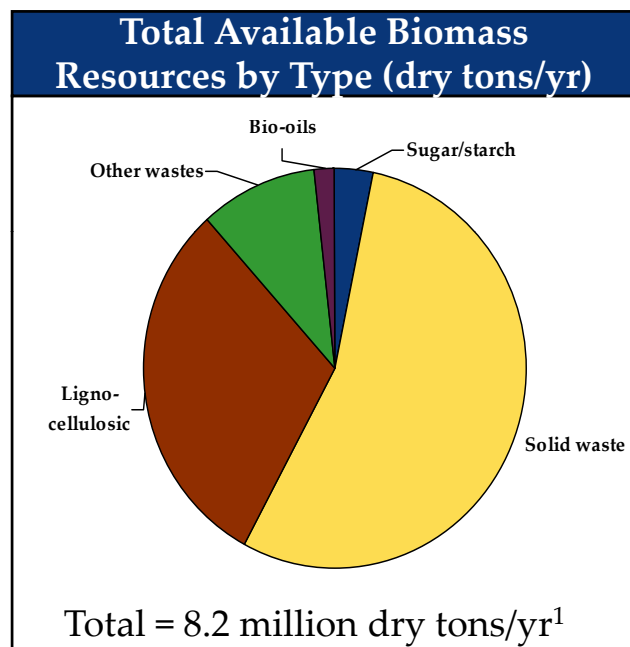
## Agriculture and forestry management are also important potential sources of biomass

- Biomass from agricultural sources include both crops and crop residues. The use of agricultural crops for energy production would require the decision to convert the current food supply chain into energy production, which could have other major policy implications. Crop residues, on the other hand, are generally underutilized and undervalued, which should allow for an easier decision to use these resources.
- In the case of energy crops, New Jersey would also need to decide whether to maintain the current crop varieties, or introduce new crops that may be better suited to energy production (eg. poplar or switchgrass).

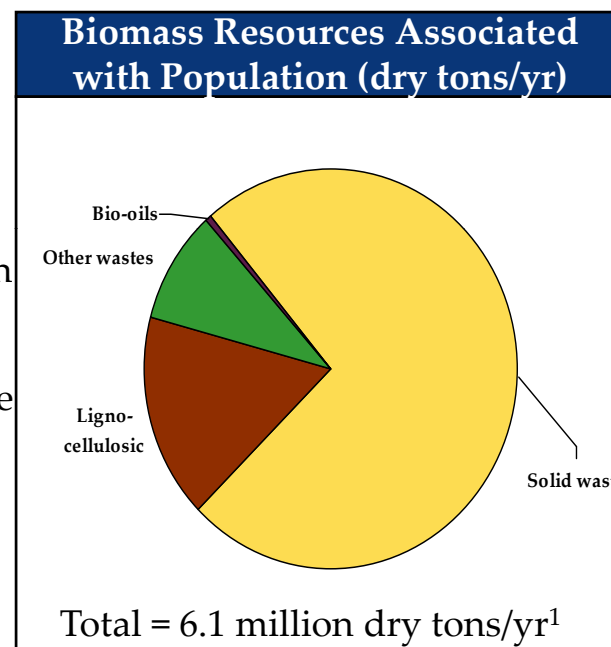


**Executive Summary » Biomass Distribution by Type**

**Almost 75% of New Jersey's biomass resource is produced directly by the state's population, much of it in the form of municipal solid waste.**



The chart on the left shows NJ's total biomass. The chart on the right shows just the population-related biomass waste stream.

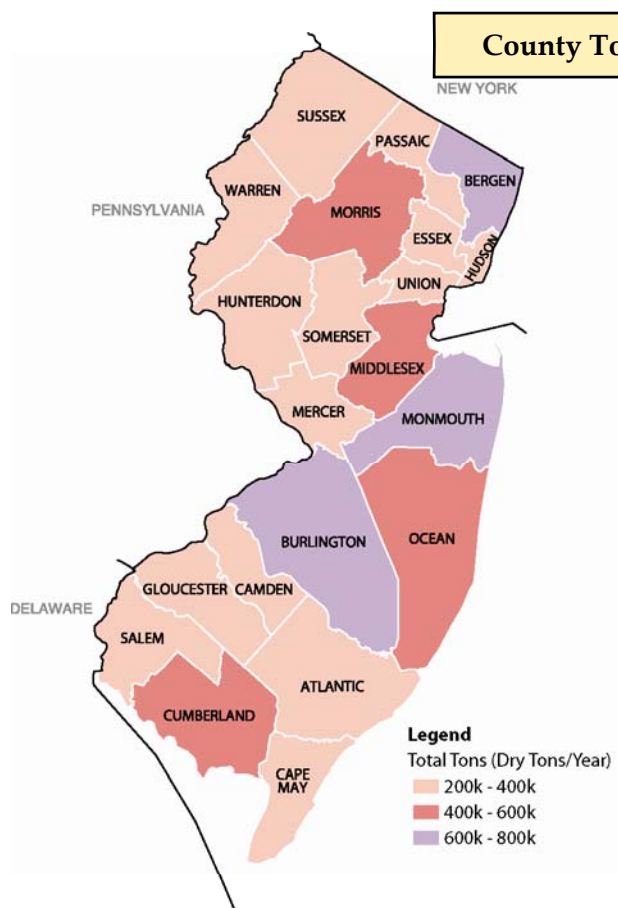


In the past, generating energy from solid waste typically involved incineration. Several new technologies described in Section III are becoming capable of converting solid waste into energy without incineration.

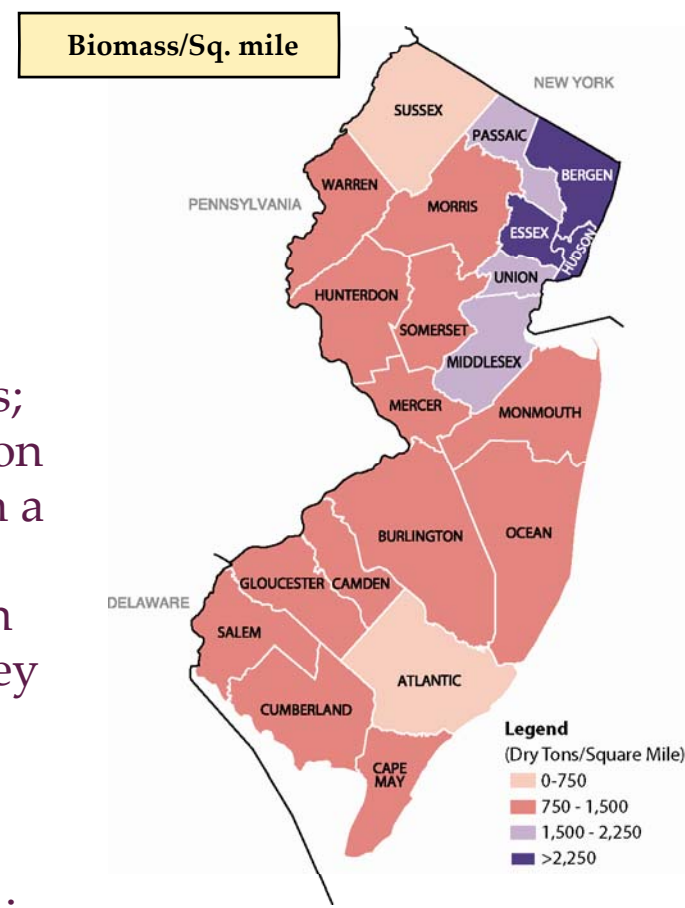
1. This total includes biogas and landfill gas quantities converted to dry ton equivalents on an energy basis. Note that these are gross quantities, not taking into account differences in heat content per ton.



Biomass is concentrated in the counties of central and northeastern New Jersey.



The energy contained in each ton of biomass is lower than for conventional fuels; thus, transportation distances between a source and an energy conversion facility can be a key factor in determining the economics of a bioenergy project .





**An early part of the project design was to identify the leading biomass to energy conversion technologies that should be evaluated**

**Considerations for this analysis included:**

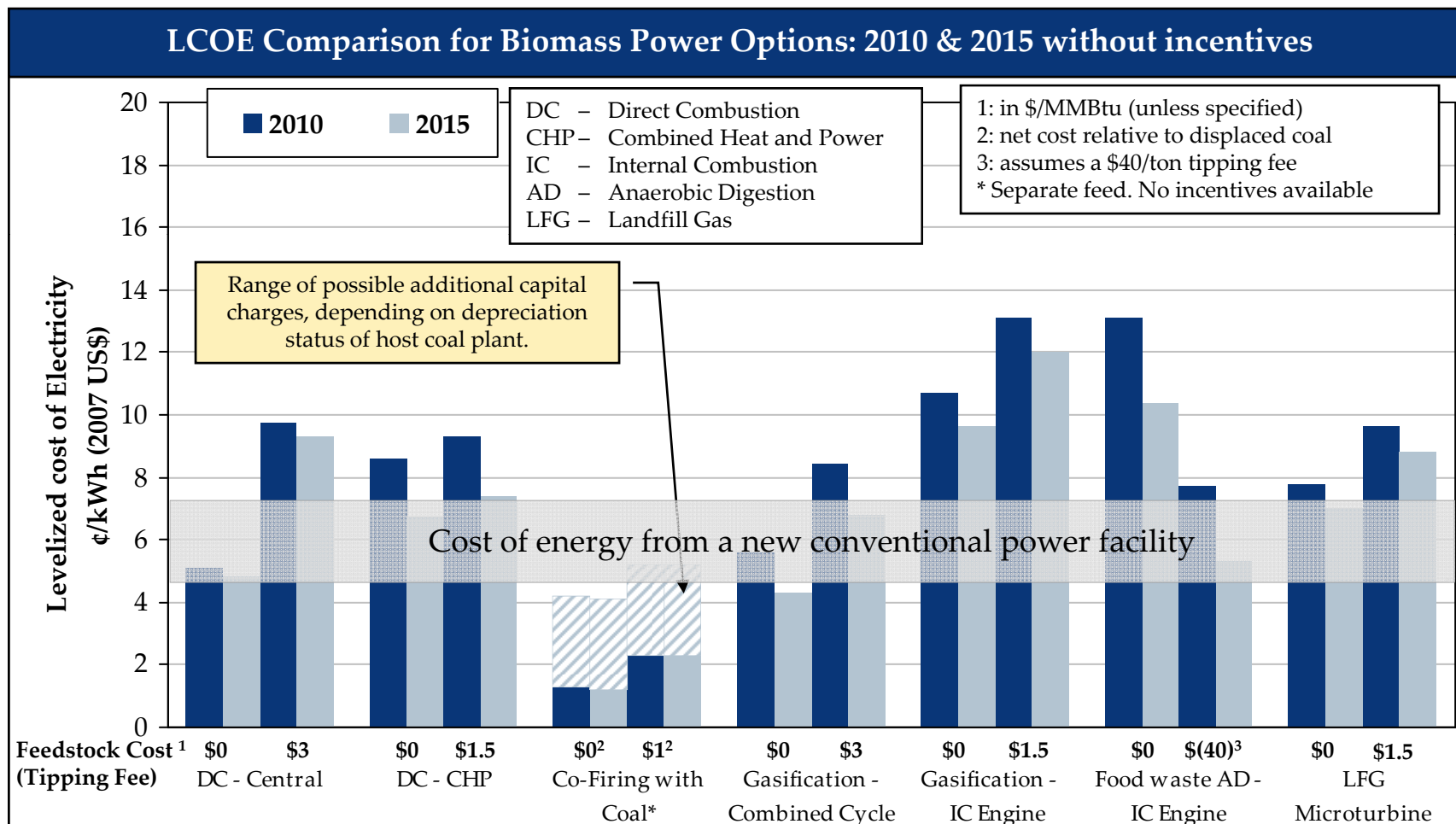
- Technical feasibility/niche applications
- Compatibility with New Jersey biomass
- Focused on broad technology platforms with similar characteristics
- Market Readiness scale

The decision to screen out specific technologies *for the current analysis* does not mean that it will not find some application in New Jersey in the future.

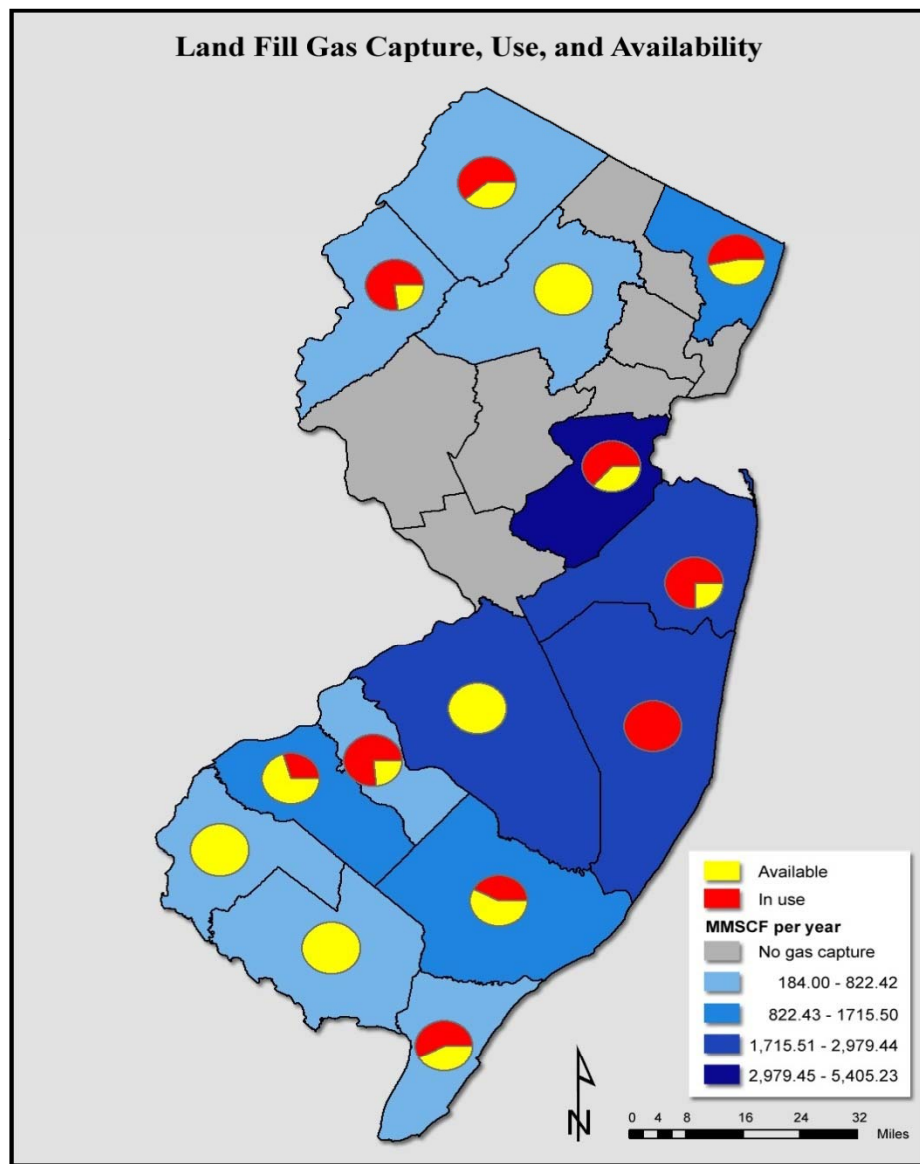
## Thirteen bioenergy applications were included in the analysis

Application	Core technology platforms and applications				
	Direct Combustion	Thermo-chemical Conversion	Fermentation	Anaerobic Digestion	Physio-chemical Conversion
<b>Power/CHP</b>	1. Stand-alone rankine (steam) cycle plant 2. Small-scale rankine cycle CHP plant 3. Biomass co-firing with coal	4. Stand-alone BIGCC plant 5. Small-scale gasification-IC engine CHP plant 6. Stand-alone pyrolysis plant		11. Food waste anaerobic digester with IC engine CHP plant/ Landfill gas with microturbine	
<b>Heat Only</b>	• Discussed qualitatively and shown in context of CHP applications above.				
<b>Transportation Fuels</b>		7. Biomass-to-liquids plant (Fischer-Tropsch) 8. Dilute acid hydrolysis for biofuels production <sup>1</sup>	9. Corn-ethanol dry mill 10. Cellulosic ethanol plant	12. CNG or LNG from landfill gas/AD gas	13. Transesterification Biodiesel

By 2010 and 2015, cost reduction potential should bring additional biopower technologies into the realm of commercial application.



**Biomass Supply Analysis » Landfill Gas Generation and Use » 2007**



Landfill Gas Totals by County in 2007 (mmscf/yr)			
County	Total Captured	Currently Used	Net Available
Atlantic	1,426.43	602.79	823.64
Bergen	1,715.50	912.50	803.00
Burlington	2,979.44	0.00	2,979.44
Camden	684.35	525.60	158.75
Cape May	474.50	273.75	200.75
Cumberland	788.40	0.00	788.40
Gloucester	1,402.04	413.34	988.69
Middlesex	5,405.23	3,444.52	1,960.71
Monmouth	2,372.50	1,788.50	584.00
Morris	503.84	0.00	503.84
Ocean	2,471.05	2,471.05	0.00
Salem	184.00	0.00	184.00
Sussex	616.40	378.90	237.50
Warren	822.42	631.45	190.97
<b>Total</b>	<b>21,846.09</b>	<b>11,442.40</b>	<b>10,403.69</b>

- A cogen station will be built on the Burlington SLF site in 2008, initially producing 7.2 MW of a possible 14.7 MW.
- All of the LFG currently flared in Salem and Cumberland will be converted to electricity in 2008.
- If converted to RNG, total LFG could produce 42 million gge's/year.

**A unique Bioenergy Calculator and interactive biomass resource database was developed to aggregate all biomass and technology information. This database contains a number of important features:**

- Detailed biomass resource data, by county, for more than **40 biomass resources**.
- Energy generation data for **13 bioenergy technologies** that takes into consideration advances in energy output and efficiency over time.
- The database was designed to analyze the biomass resource data and technology assessment data in an interactive fashion. The database is:
  - Structured by county and resource type
  - Contains technology performance estimates to convert biomass quantities into energy (electricity and fuel) potential.
- The **Bioenergy Calculator** yields projected biopower and biofuel estimates for 2007, 2010, 2015, 2020.
- The database allows for continual updating as additional data is collected and refined.
- A screening tool is imbedded in the database to conduct sensitivity analyses on the estimate of recoverable biomass.

## NJ Biomass Inventory by County

County	Sugar/ Starch	Ligno	Bio-Oils	Solid Waste			Other Wastes	Totals (Tons)
				Recycled	Landfilled Biomass	C&D non- recycled		
Atlantic	3,170	108,957	1,179	31,919	115,217	25,602	30,315	316,358
Bergen	4	87,455	3,779	169,401	294,436	69,209	115,775	740,060
Burlington	29,787	255,697	23,040	60,576	149,554	32,570	130,609	681,833
Camden	2,477	118,822	2,550	29,799	39,659	41,743	34,565	269,615
Cape May	831	145,752	851	24,249	42,421	24,471	8,925	247,500
Cumberland	26,681	216,226	10,823	54,495	56,829	13,574	42,461	421,088
Essex	-	37,392	3,313	76,587	87,559	71,750	40,251	316,851
Gloucester	15,206	173,089	11,462	27,420	15,704	20,022	58,327	321,229
Hudson	-	7,949	2,527	109,051	191,915	41,639	19,328	372,410
Hunterdon	25,370	138,574	5,985	11,304	42,090	56,986	31,986	312,295
Mercer	9,306	80,835	8,101	75,089	113,978	25,883	12,200	325,393
Middlesex	11,212	95,451	8,216	169,437	260,179	81,044	52,927	678,466
Monmouth	11,537	151,043	8,639	92,865	199,296	49,677	54,940	567,996
Morris	4,429	114,985	2,431	71,636	165,620	38,695	33,375	431,170
Ocean	2,239	156,619	2,833	85,768	221,097	43,008	17,981	529,543
Passaic	6	52,724	2,090	94,517	177,172	38,164	3,308	367,980
Salem	59,560	135,424	18,675	5,396	17,035	14,625	37,777	288,492
Somerset	9,267	67,465	2,282	40,404	104,843	1,482	14,546	240,289
Sussex	6,796	160,795	653	17,667	40,322	11,216	35,978	273,427
Union	5	42,242	2,225	46,261	60,536	48,164	10,022	209,455
Warren	48,006	135,236	5,014	10,588	11,150	7,822	53,302	271,117
<b>TOTALS</b>	265,887	2,482,731	126,666	1,304,429	2,406,613	757,346	838,899	8,182,570

**Full Bioenergy Assessment Report and  
Bioenergy Calculator is available on-line at:  
<http://njaes.rutgers.edu/bioenergy>**

**Contact Information**

**David Specca**

Assistant Director, Rutgers EcoComplex  
1200 Florence Columbus Road  
Bordentown, NJ 08505  
609-499-3600 x226  
[specca@aesop.rutgers.edu](mailto:specca@aesop.rutgers.edu)

**Renewable Energy Committee Meeting**

**Attendees**

Tuesday, July 12, 2011  
 Conservation Services Group

1:00pm - 3:30pm

<b>Initial</b>	<b>Name</b>	<b>Company</b>	<b>Phone</b>	<b>E-mail</b>
	Ambrosio, Mike	AEG	(732) 447-1355	<a href="mailto:mambrosio@appliedenergygroup.com">mambrosio@appliedenergygroup.com</a>
	Bachmann, Joanne	VEIC		<a href="mailto:joanne.bachmann@veic-nj.org">joanne.bachmann@veic-nj.org</a>
	Borruso, John	Con Ed Energy	(914) 421-2324	<a href="mailto:borrusoj@conedcss.com">borrusoj@conedcss.com</a>
	Cadoret, Joshua	Pepco Holdings	(302) 454-4589	<a href="mailto:joshua.cadoret@pepcoholdings.com">joshua.cadoret@pepcoholdings.com</a>
	Colon, Michelle	CSG	(732) 218-4429	<a href="mailto:michelle.colon@csgrp.com">michelle.colon@csgrp.com</a>
	Damiani, David	CSG		<a href="mailto:david.damiani@csgrp.com">david.damiani@csgrp.com</a>
	Dewitt, Frank	AEA	(973) 303-6400	<a href="mailto:fdewitt@altenergy1.com">fdewitt@altenergy1.com</a>
	DONADIO, TOM	JERSEY CENTRAL POWER	(973) 401-8534	<a href="mailto:tdonadio@firstenergycorp.com">tdonadio@firstenergycorp.com</a>
	Dube, Evan	SunRun, Inc	(617) 997-8850	<a href="mailto:evand@sunrunhome.com">evand@sunrunhome.com</a>
	Garrison, Charlie	Honeywell	(973) 890-9500	<a href="mailto:charlie.garrison@honeywell.com">charlie.garrison@honeywell.com</a>
	Gouda, Saher	Schuco-USA	(732) 614-6654	<a href="mailto:sgouda@schuco-usa.com">sgouda@schuco-usa.com</a>
	Gray, Tammy	VEIC	(732) 218-3418	<a href="mailto:tammy.gray@csgrp.com">tammy.gray@csgrp.com</a>
	Haaz, Frank	AAHG Energy	856-435-3200 x-211	<a href="mailto:fhaaz@wagnershires.com">fhaaz@wagnershires.com</a>
	Halse, Lucy	Vanguard Energy Partners	908.534.1302	<a href="mailto:lhalse@vanguardenergypartners.com">lhalse@vanguardenergypartners.com</a>
	Heller, Theresa	VEIC	(732) 218-3415	<a href="mailto:theresa.heller@csgrp.com">theresa.heller@csgrp.com</a>
	Hendricks, Mahogany	BPU		<a href="mailto:mahogany.hendricks@bpu.state.nj.us">mahogany.hendricks@bpu.state.nj.us</a>
	Hennessey, Jack	American Capital Energy	(914) 469-7884	<a href="mailto:jack.hennessey@americancapitalenergy.com">jack.hennessey@americancapitalenergy.com</a>
	Hill, David	VEIC	(802) 658-6066	<a href="mailto:dhill@veic.org">dhill@veic.org</a>
	Hoey, Brigitte	NJ Solar Power	(732) 281-3520	<a href="mailto:brigitte@njsolarpower.com">brigitte@njsolarpower.com</a>
	Hunter, Scott	OCE/NJBPU	(609) 777-3300	
	Kaiser, Herb	Smart E2 Solutions	(732) 241-6070	<a href="mailto:herbkaiser@se2sol.com">herbkaiser@se2sol.com</a>
	Lalla, Gail	Greener by Design	(732) 253-7717	<a href="mailto:glalla@gbdtoday.com">glalla@gbdtoday.com</a>
	Lynk, Fred	PSE&G	(973) 430-8155	<a href="mailto:frederick.lynk@pseg.com">frederick.lynk@pseg.com</a>
	Mason, Casi	Corbin Solar		<a href="mailto:casi@corbinsolar.com">casi@corbinsolar.com</a>
	McAleer, Jim	Solar Electric NJ, LLC	856-220-7070	<a href="mailto:jim@SolarElectricNJ.com">jim@SolarElectricNJ.com</a>
	McCarthy, Melissa	Ecological Systems		<a href="mailto:melissa@ecologicalsystems.biz">melissa@ecologicalsystems.biz</a>
	MEYER, JAMES	RIKER DANZIG	9735380800	
	Miller, Jeffrey	Quadrillion RE	(201) 707-4024	<a href="mailto:jmiller@quadrillionsolar.com">jmiller@quadrillionsolar.com</a>
	Miller, John	The Solar Center	973-627-7739 x-118	<a href="mailto:jmiller@thesolarcenter.com">jmiller@thesolarcenter.com</a>
	Muskatt, Rosalie	New Age Solar	(609) 223-0277	<a href="mailto:rmuskatt@optonline.net">rmuskatt@optonline.net</a>
	Neely, Bruce	Solar-Bridge, LLC		<a href="mailto:bneely@solar-bridge.com">bneely@solar-bridge.com</a>
	Peters, Christopher	Acadian Consulting Group	517.518.1294	<a href="mailto:cpeter9@gmail.com">cpeter9@gmail.com</a>
	Reisman, Ron	VEIC		<a href="mailto:ronreisman@nyc.rr.com">ronreisman@nyc.rr.com</a>
	Rowe, Gayle	JBS Solar and Wind, LLC	(609) 884-7373	<a href="mailto:jbssolarandwind@yahoo.com">jbssolarandwind@yahoo.com</a>
	Schaal, Gary	Solar Electric NJ, LLC	(609) 929-1746	<a href="mailto:gary@solarelectricnj.com">gary@solarelectricnj.com</a>
	Schreader, Rich	First Energy Utilities	(610) 921-6913	<a href="mailto:rschreader@firstenergycorp.com">rschreader@firstenergycorp.com</a>
	Schultz, Scott	Advanced Solar Products		<a href="mailto:scott@advancedsolarproducts.com">scott@advancedsolarproducts.com</a>
	Sehein, Angela	Corbin Solar		<a href="mailto:angela@corbinsolar.com">angela@corbinsolar.com</a>
	Sinai, Michael	EELC, Newark		<a href="mailto:wschulte@easterenvironmental.org">wschulte@easterenvironmental.org</a>
	St.Onge, George	RRREC	(732) 801-6828	<a href="mailto:george@rrrec.net">george@rrrec.net</a>
	Steindel, Sarah	Rate Counsel		<a href="mailto:ssteinde@rpa.state.nj.us">ssteinde@rpa.state.nj.us</a>
	Tamargo, Armando	Insign Capital	(973) 945-1230	<a href="mailto:armando@wsigi.com">armando@wsigi.com</a>
	Teague, John	NJ BPU	(973) 648-7102	<a href="mailto:john.teague@bpu.state.nj.us">john.teague@bpu.state.nj.us</a>
	Thanjai, Benoy	Vanguard Energy Partners	(732) 302-3708	<a href="mailto:bthanjai@vanguardenergypartners.com">bthanjai@vanguardenergypartners.com</a>
	Thompson, Howard	Russo Tummuly for PPL	(973) 993-4477	<a href="mailto:hthompson@russotumulty.com">hthompson@russotumulty.com</a>
	Tomeo, Matt	Mercury Solar Systems	(215) 787-9999	<a href="mailto:mtomeo@mercurysolarsystems.com">mtomeo@mercurysolarsystems.com</a>
	Washburn, Jennifer	Brite Idea Energy	(888) 91-BRITE	<a href="mailto:jenniferw@briteideanergy.com">jenniferw@briteideanergy.com</a>
	Weisman, David	Green Alternatives	(973) 364-8065	<a href="mailto:greenalternatives@comcast.net">greenalternatives@comcast.net</a>
	Winka, Michael	NJBPU-OCE	(609) 777-3335	<a href="mailto:michaelwinka@bpu.state.nj.us">michaelwinka@bpu.state.nj.us</a>
	Zislin, Neal	Renu Energy	(908) 371-0014	<a href="mailto:nzislin@renuenergy.com">nzislin@renuenergy.com</a>