

From: phil@resourcerenewables.com
To: [Growth Management Committee](#); [Eric Lardy](#)
Cc: [Matthew Hall](#); [Priya Bhat-Patel](#); [Keith Blackburn](#); [Teresa Acosta](#); [Peder Norby](#); [Attorney](#); [City Clerk](#); [Jason Haber](#)
Subject: Recommendations for the City of Carlsbad
Date: Friday, October 28, 2022 3:56:08 PM
Attachments: [Carlsbad Committee Letter.pdf](#)
[Maerkle Reservoir Solar Project Summary.pdf](#)

October 28, 2022

Dear Committee Members,

This letter is mainly about finding several land sites for local 20-100 acre solar projects within Carlsbad, most notably the long anticipated Maerkle Reservoir solar project. This solar project is roughly 50 acres in size, will produce around 25 megawatts (MW) of power, and will supply more than 5,000 homes with year-long energy needs. The attached summary PDF file lists several city and community benefits. We are clean energy developers, and we propose a public-private partnership as a way for the City of Carlsbad to make money by turning its available land into performing assets. We can demonstrate that solar projects are the highest and best use of most flat, open land, especially when south-facing. In addition, as an environmental engineer with a PhD from Caltech, it's hard not to tie clean energy with related topics of concern, including housing, water, and climate change. We contend that a city that ignores these topics has a dismal future, whereas a city that masters these topics will thrive for decades to come. Let's ensure Carlsbad continues to thrive.

Suggested Recommendations to City

1. Examine in detail the roles that climate change will play in the uses and availability of water and electricity over the next two or three decades.
2. Establish safe and resilient sources of water and electricity for city residents and city businesses derived from sustainable local resources.
3. Develop, build, and own a nominally 25 MW solar power project at Maerkle Reservoir with a similar amount of power storage capacity.
4. Take an equity position to own the Maerkle Reservoir solar project, achieve market returns of 10% or more on that equity position, and collect a yearly land lease from the solar project.
5. Identify and convert city land into performing assets, including additional solar projects similar to the one at Maerkle Reservoir.
6. Seek other solar project locations within or around the City of Carlsbad, whether on 20-100 acres of city land, other public lands, or on private land, including locations at nearby cities that are part of the Clean Energy Alliance.
7. Realize the benefits of low-cost clean energy, local jobs, and local investment from solar projects in and around the City of Carlsbad.
8. Pass a city ordinance that requires all large parking lots and large roof tops to install solar panels within the next five years, with waivers granted for exceptions such as structural limitations, visibility constraints, and other reasonable considerations.

9. Find and secure long-term sources of water in a manner that is consistent with climate change forecasts over a 20-30 year long time horizon.
10. Increase the capacity of the desalinization plant and run it on locally generated, low-cost clean energy.
11. Place high-density housing next to major retail centers and ensure the high-density housing has solar panels on the roofs of the buildings and on the roofs of new parking structures.
12. Prepare plans to address growing natural hazards such as flash floods, sea level rise, heat waves, droughts, and wildfires over the next 20-30 years.

City Leadership

One of the many outstanding features of the City of Carlsbad is its leadership among California cities, and in fact around the nation. This leadership arises in part from committees like this one. The expertise and experience of committee members is invaluable for long-term planning and re-positioning the City of Carlsbad for ongoing leadership far into the future. Your service makes a difference.

Water, Energy, Housing

The sustainability of human beings and cities on this planet depends in decent measure on the confluence of water, energy, and housing. This is particularly true in Southern California, which is already facing long-term drought conditions, but is also one of the best solar power sites in the world. Let's address housing, water, and energy one at a time. These three subjects support the City of Carlsbad thriving far into the future.

Location, Location, Location

High-density housing is one of the better-known solutions to housing, including the often more challenging subject of affordable housing. Real estate development is often the second highest and best use of a given parcel of land (behind solar power). The main question would be where to place high-density housing in the City of Carlsbad? It would be a losing proposition to place such housing on prime solar power land — flat and south facing fields such as the land at Maerkle Reservoir. Placing high-density housing in and around Carlsbad Village is possible, but maybe not advisable. People coming home from work and tourists having a good time may or may not vibe well together. It's tricky at best; it's a delicate balance to strike. There is a better solution. Perhaps the largest and most enticing parcels of land for high density housing are near the shopping districts — of which there are a number of retail centers in Carlsbad (among The Shoppes at Carlsbad, College Plaza, Carlsbad Premium Outlets, Bressi Ranch Village Center, The Forum Carlsbad, La Costa Town Square, Plaza Paseo Real, etc.). These retail centers may require updated city zoning, design priorities focused on high-density housing, as well as new parking structures. What matters is high-density housing and retail go well together. They are great places to concentrate new building.

Always Thirsty

The City of Carlsbad benefits from a desalinization plant that provides fresh water to the community. While it may have been controversial some time ago, producing fresh water from sea water is becoming more valuable and prescient year by year. The current drought is forecast by climate change models to get worse and worse over the next several decades – today's drought conditions are probably the tip of the iceberg. The existing sources of city water and the existing agreements over water rights are already under some stress. To that point, the Colorado River is in crisis, and its water can no longer be taken for granted, even in high priority regions such as the Imperial Valley or greater San Diego. The current planning time horizon for water is five years, whereas a planning time horizon of 20-30 years would make more sense these days. Two potential improvements can be suggested by the committee.

1. The desalinization plant can be run on locally generated, low-cost clean energy. This would be the ultimate sustainability goal, and it could lower the cost of the water as well.
2. Long term sources of water need to be sourced and secured in a manner that is consistent with climate change forecasts and a time horizon decades long.

Highest and Best Use

Local solar power can be shown to be the highest and best use of a large parcel of land with respect to city finances - providing yearly leasing revenue, long term equity returns, economic investment, and permanent jobs that (individually and collectively) meet or exceed traditional real estate development. The City of Carlsbad should find a reasonable balance between housing and clean energy across city lands. Clean energy is a valuable part of our sustainable future, and placing that clean energy within or near the community yields safe power, local resiliency, lower prices, and economic development. For example, Maerkle Reservoir is a prime location, because it is isolated, flat, and facing south. Turning Maerkle Reservoir into a large solar power project is in fact already part of the City of Carlsbad Climate Action Plan. Likewise, schools and similar public facilities are prime locations for installing both solar power and energy storage. In addition, three other improvements can be suggested by the Committee.

1. Other possible solar locations should be sought by the City of Carlsbad, whether on city land or private land. The benefits are too valuable: low cost clean energy, local jobs, local investment, lower energy bills, grid resiliency, fewer power disruptions, lower wildfire risk, and local management of community power.
2. Regional solar project locations in nearby cities can be sought by the City of Carlsbad as a negotiation to be carried out by the City of Carlsbad with other cities that are members of the Clean Energy Alliance.
3. The City of Carlsbad can also pass an ordinance that rooftop solar be installed on large buildings and carport solar in large parking lots over the next five years. It's profitable, safe, resilient, increases power reliability, reduces wildfire risks, and promotes private sustainability actions behind the meter.

Three Financial Models

If the City of Carlsbad is going to place solar projects on its own land, it may want to own the project itself. There are three different financial models to choose from.

1. Spend the money outright
2. Break even like a nonprofit
3. Achieve 10% market returns

The Committee is in a position to recommend market returns of 10% or more on solar power projects owned by the city. City land can and should become a performing asset that prints money for city coffers. This is a dependable and synergistic revenue source given the money originates from reliable Carlsbad energy consumers, who also benefit from lower energy bills and local economic development.

All In The Family

What are the benefits of doing a large solar project on city land?

- 1) The city gets paid a land lease every year, which turns the land into a performing asset. The land lease is higher than expected property tax revenue each year, and has a higher net present value than selling the land to a developer.
- 2) The owner of the solar project – which on city land can be the city itself, or a third party private equity group, or both at the city's discretion – gets the 10% or higher returns from the project equity investment. This asset is readily bought and sold among many interested players, and so remains relatively liquid.
- 3) A local Community Choice Aggregator (CCA) such as the Clean Energy Alliance would buy the low-cost clean energy from the solar project, which is basically the city selling the power to itself. The revenue stream is derived from the electricity customers of the city, so this revenue can be considered steady and reliable.
- 4) The residents of Carlsbad, as well as the businesses within Carlsbad, would benefit from lower electricity bills due to low cost power from such solar projects. That would increase disposable cash for both residents and businesses alike. The city would also be in a position to stabilize electricity rates against long term utility rate hikes, reducing both uncertainty and inflation.
- 5) The city at large would benefit from the economic development of such a large project (around \$75 million), along with dozens of prevailing wage construction jobs as well as long-term management jobs, among other similar benefits. These same dollars often circulate 2-3 times throughout the city, bringing additional multiples in economic benefits. That's the key to local community power.
- 6) The electricity supply within the city would become more resilient from ample energy storage on site. Because the energy storage is local, the entire city would be subject to fewer blackouts, energy disruptions, or summer price hikes. This is literally the city determining its own stable and resilient energy future.
- 7) The electricity supply within the city would also become safer. Local energy storage reduces peak transmission line usage, resulting in a

lower likelihood of wildfires from nearby transmission lines. This will shift the city fire services away from imminent risks and into a stronger preventative posture.

Maerkle Reservoir Specifics

1. Solidify Carlsbad's long term leadership in the area of clean energy
2. Fulfill the city's Climate Action Plan's intended use for Maerkle Reservoir
3. Generate safe and resilient clean energy within the City of Carlsbad
4. Decentralize power generation away from distant, disconnected, and monstrous entities
5. Generate power close to the end user and avoid transmission costs, transmission losses, and reduce local wildfire risks
6. Identify and reserve public lands for large local solar projects in and around the greater Carlsbad and North County region
7. Create public-private partnerships to develop clean energy projects on public lands designated for solar projects
8. Maerkle Reservoir is a prime flat, south-facing, isolated field perfect for ground mounted solar and energy storage
9. Around 25 MW of power, roughly 5% of Carlsbad usage, and around 5000 homes will be powered year round by Maerkle Reservoir alone
10. A solar project land lease for the city is the highest and best use of city land, above and beyond traditional housing development or property tax revenue
11. Earn 10% or more market returns on city equity dollars invested
12. Turn city lands into performing assets that make yearly leasing revenue as well as project equity returns
13. The power sold to city customers through the Clean Energy Alliance will be at prices that beat the local utility with ease, stabilizing long term prices
14. This a safe and liquid investment that can be sold on the open energy markets
15. Garner financial benefits from \$75 million investment, including dozens of prevailing wage jobs and management jobs, as well as economic multiples thereof
16. Equity stake for the City of Carlsbad in this project would be 10% of the project total value, which is ($\$75 \text{ million} \times 10\% =$) \$7.5 million with 10% or more returns

What's the Real Point?

For the last few years, clean energy has been the least expensive form of energy bar none. Solar power is cheaper than coal-fired power plants. Battery storage is cheaper than natural gas peaker plants. The financial motivations for switching to clean energy are settled once and for all. This is especially true in SDG&E territory, where prices are among the highest in the nation. The question becomes: where do you put the clean energy? Do you put it far away out in the desert, or do you put it nearby the end user? If you put the clean energy nearby, then you no longer experience significant transmission losses (30-50% of power in California), transmission expenses (4-12 cents per kWh extra), or transmission hazards (blackouts and wildfires), while you gain the benefits of economic development, local jobs, along with safe and resilient power for the community. That's why finding land for solar

projects within the City of Carlsbad is so valuable. Land nearby in Vista or Oceanside would work as well, as long as those cities are part of the Clean Energy Alliance. A local renewable energy solution is therefore a regional solution. We need to point out this is not a microgrid, because everything and everybody remains connected to the existing electricity grid. This is simply local electricity to avoid blackouts and wildfires, while decreasing the cost of your electricity bills at the same time.

Climate Change

Climate change is already stressing some cities in ways they did not anticipate and were not prepared for. You see various disasters on the news — floods, wildfires, droughts, storms, heat waves, etc. — and they are only getting more frequent and more intense. This is a good time to revise and upgrade city plans. What used to be rare and unpredictable will become all too common. It's better to be prepared. However, saying something like the water allocation is acceptable for the next five years does nothing for housing or energy projects designed to last 30-50 years. The longer view looks different, and perhaps a bit scarier. You can be certain things will change. And every city is much more likely to experience at least one natural disaster over those 30-50 years. So the assets and operations of the city need to be protected long term to ensure the ongoing functions of daily life.

1. Flooding events, including flash floods, are setting new records and happening more frequently. This is in part because of intense rain bombs and because of stalled storm patterns. These used to be rare, and they are becoming more common. The rates and amounts of precipitation have grown. Old flood maps are no longer reliable. So even during a drought, we can expect a few hours or days of staggering precipitation. The City of Carlsbad has potential flood zones, and may not have enough infrastructure in place to handle increased precipitation rates. The city Drainage capabilities may need to be upgraded.
2. Sea level rise will only accelerate in the next couple of decades due to record ice melting in Greenland and collapsing ice shelves in Antarctica, as well as hotter ocean temperatures that cause the oceans to swell in size. The rates of ice entering the oceans are currently exceeding predictions, and there is no known way to slow out of control melting. At the shoreline, one inch of sea level rise erodes away around 20 inches of beach, so the impact near the shoreline is surprisingly severe. Stronger ocean storms can then tear down beach structures and attack beach cliffs more easily. Shorelines are in peril and cliffs can be expected to crumble. Houses, train tracks, and roads will face new and increased hazards moving forward. Protective measures and new traffic patterns will be needed.
3. Heat waves will only get more intense and more frequent. Hot weather is apparently the biggest climate killer and heat waves the most readily attributable to climate change. Heat waves will drive people inside with higher air conditioning loads on the local electricity grids. If local clean energy projects are not installed nearby, you can expect increased wildfire frequency from overloaded and overheated transmission lines. Even living near the ocean will no longer protect cities with a cool ocean breeze, as used to be the case. Instead, high pressure systems will sit offshore and bake millions of people. Extreme fire hazards will persist for one or more weeks.

4. The drought in California is predicted by climate change models to continue and only get worse. The current water situation is just the beginning. Having the highest priority on Colorado River water and being a city that is a “drop in the bucket” will mean nothing 10-20 years from now. If there is no water, there is no water. Water rights or city size won’t matter. A longer-term planning time horizon is needed to keep the water flowing for decades into the future. Water is life. The city needs to secure the sources of that water sooner rather than later, before scarcity sets in or prices climb too high. Ongoing drought will also increase all sorts of fire risks.

Contact

We welcome any questions or comments you may have. Please feel free to contact us and discuss any of these matters. We can also assemble public materials and scholarly references on any of the subjects above.

Sincerely,

Dr. Phil Watts

--

Dr. Phil Watts
CEO, Chair Resource
Cell: 562-607-2132

[https://urldefense.com/v3/_http://www.resourcerenewables.com_!!E_4xU6-vwMWK-Q!s2FPrXUsCZ1zv4M-rHgSyzDA1ZEQ5fbeen4nyFW777F63qrRNL4Wn6V4yOs-iXAVTxiYQA0k0Ax1MFC-Jq_uqCoedIU\\$](https://urldefense.com/v3/_http://www.resourcerenewables.com_!!E_4xU6-vwMWK-Q!s2FPrXUsCZ1zv4M-rHgSyzDA1ZEQ5fbeen4nyFW777F63qrRNL4Wn6V4yOs-iXAVTxiYQA0k0Ax1MFC-Jq_uqCoedIU$)

CAUTION: Do not open attachments or click on links unless you recognize the sender and know the content is safe.



October 28, 2022

Dear Committee Members,

This letter is mainly about finding several land sites for local 20-100 acre solar projects within Carlsbad, most notably the long anticipated Maerkle Reservoir solar project. This solar project is roughly 50 acres in size, will produce around 25 megawatts (MW) of power, and will supply more than 5,000 homes with year-long energy needs. The attached summary PDF file lists several city and community benefits. We are clean energy developers, and we propose a public-private partnership as a way for the City of Carlsbad to make money by turning its available land into performing assets. We can demonstrate that solar projects are the highest and best use of most flat, open land, especially when south-facing. In addition, as an environmental engineer with a PhD from Caltech, it's hard not to tie clean energy with related topics of concern, including housing, water, and climate change. We contend that a city that ignores these topics has a dismal future, whereas a city that masters these topics will thrive for decades to come. Let's ensure Carlsbad continues to thrive.

Suggested Recommendations to City

1. Examine in detail the roles that climate change will play in the uses and availability of water and electricity over the next two or three decades.
2. Establish safe and resilient sources of water and electricity for city residents and city businesses derived from sustainable local resources.
3. Develop, build, and own a nominally 25 MW solar power project at Maerkle Reservoir with a similar amount of power storage capacity.
4. Take an equity position to own the Maerkle Reservoir solar project, achieve market returns of 10% or more on that equity position, and collect a yearly land lease from the solar project.
5. Identify and convert city land into performing assets, including additional solar projects similar to the one at Maerkle Reservoir.
6. Seek other solar project locations within or around the City of Carlsbad, whether on 20-100 acres of city land, other public lands, or on private land, including locations at nearby cities that are part of the Clean Energy Alliance.
7. Realize the benefits of low-cost clean energy, local jobs, and local investment from solar projects in and around the City of Carlsbad.
8. Pass a city ordinance that requires all large parking lots and large roof tops to install solar panels within the next five years, with waivers granted for exceptions such as structural limitations, visibility constraints, and other reasonable considerations.
9. Find and secure long-term sources of water in a manner that is consistent with climate change forecasts over a 20-30 year long time horizon.

10. Increase the capacity of the desalinization plant and run it on locally generated, low-cost clean energy.
11. Place high-density housing next to major retail centers and ensure the high-density housing has solar panels on the roofs of the buildings and on the roofs of new parking structures.
12. Prepare plans to address growing natural hazards such as flash floods, sea level rise, heat waves, droughts, and wildfires over the next 20-30 years.

City Leadership

One of the many outstanding features of the City of Carlsbad is its leadership among California cities, and in fact around the nation. This leadership arises in part from committees like this one. The expertise and experience of committee members is invaluable for long-term planning and re-positioning the City of Carlsbad for ongoing leadership far into the future. Your service makes a difference.

Water, Energy, Housing

The sustainability of human beings and cities on this planet depends in decent measure on the confluence of water, energy, and housing. This is particularly true in Southern California, which is already facing long-term drought conditions, but is also one of the best solar power sites in the world. Let's address housing, water, and energy one at a time. These three subjects support the City of Carlsbad thriving far into the future.

Location, Location, Location

High-density housing is one of the better-known solutions to housing, including the often more challenging subject of affordable housing. Real estate development is often the second highest and best use of a given parcel of land (behind solar power). The main question would be where to place high-density housing in the City of Carlsbad? It would be a losing proposition to place such housing on prime solar power land — flat and south facing fields such as the land at Maerkle Reservoir. Placing high-density housing in and around Carlsbad Village is possible, but maybe not advisable. People coming home from work and tourists having a good time may or may not vibe well together. It's tricky at best; it's a delicate balance to strike. There is a better solution. Perhaps the largest and most enticing parcels of land for high density housing are near the shopping districts — of which there are a number of retail centers in Carlsbad (among The Shoppes at Carlsbad, College Plaza, Carlsbad Premium Outlets, Bressi Ranch Village Center, The Forum Carlsbad, La Costa Town Square, Plaza Paseo Real, etc.). These retail centers may require updated city zoning, design priorities focused on high-density housing, as well as new parking structures. What matters is high-density housing and retail go well together. They are great places to concentrate new building.

Always Thirsty

The City of Carlsbad benefits from a desalinization plant that provides fresh water to the community. While it may have been controversial some time ago, producing fresh water from sea water is becoming more valuable and prescient year by year. The current drought is forecast by climate change models to get worse and worse over the next several decades – today’s drought conditions are probably the tip of the iceberg. The existing sources of city water and the existing agreements over water rights are already under some stress. To that point, the Colorado River is in crisis, and its water can no longer be taken for granted, even in high priority regions such as the Imperial Valley or greater San Diego. The current planning time horizon for water is five years, whereas a planning time horizon of 20-30 years would make more sense these days. Two potential improvements can be suggested by the committee.

1. The desalinization plant can be run on locally generated, low-cost clean energy. This would be the ultimate sustainability goal, and it could lower the cost of the water as well.
2. Long term sources of water need to be sourced and secured in a manner that is consistent with climate change forecasts and a time horizon decades long.

Highest and Best Use

Local solar power can be shown to be the highest and best use of a large parcel of land with respect to city finances - providing yearly leasing revenue, long term equity returns, economic investment, and permanent jobs that (individually and collectively) meet or exceed traditional real estate development. The City of Carlsbad should find a reasonable balance between housing and clean energy across city lands. Clean energy is a valuable part of our sustainable future, and placing that clean energy within or near the community yields safe power, local resiliency, lower prices, and economic development. For example, Maerkle Reservoir is a prime location, because it is isolated, flat, and facing south. Turning Maerkle Reservoir into a large solar power project is in fact already part of the City of Carlsbad Climate Action Plan. Likewise, schools and similar public facilities are prime locations for installing both solar power and energy storage. In addition, three other improvements can be suggested by the Committee.

1. Other possible solar locations should be sought by the City of Carlsbad, whether on city land or private land. The benefits are too valuable: low cost clean energy, local jobs, local investment, lower energy bills, grid resiliency, fewer power disruptions, lower wildfire risk, and local management of community power.
2. Regional solar project locations in nearby cities can be sought by the City of Carlsbad as a negotiation to be carried out by the City of Carlsbad with other cities that are members of the Clean Energy Alliance.
3. The City of Carlsbad can also pass an ordinance that rooftop solar be installed on large buildings and carport solar in large parking lots over the next five years. It’s profitable, safe, resilient, increases power reliability, reduces wildfire risks, and promotes private sustainability actions behind the meter.

Three Financial Models

If the City of Carlsbad is going to place solar projects on its own land, it may want to own the project itself. There are three different financial models to choose from.

1. Spend the money outright
2. Break even like a nonprofit
3. Achieve 10% market returns

The Committee is in a position to recommend market returns of 10% or more on solar power projects owned by the city. City land can and should become a performing asset that prints money for city coffers. This is a dependable and synergistic revenue source given the money originates from reliable Carlsbad energy consumers, who also benefit from lower energy bills and local economic development.

All In The Family

What are the benefits of doing a large solar project on city land?

- 1) The city gets paid a land lease every year, which turns the land into a performing asset. The land lease is higher than expected property tax revenue each year, and has a higher net present value than selling the land to a developer.
- 2) The owner of the solar project – which on city land can be the city itself, or a third party private equity group, or both at the city's discretion – gets the 10% or higher returns from the project equity investment. This asset is readily bought and sold among many interested players, and so remains relatively liquid.
- 3) A local Community Choice Aggregator (CCA) such as the Clean Energy Alliance would buy the low-cost clean energy from the solar project, which is basically the city selling the power to itself. The revenue stream is derived from the electricity customers of the city, so this revenue can be considered steady and reliable.
- 4) The residents of Carlsbad, as well as the businesses within Carlsbad, would benefit from lower electricity bills due to low cost power from such solar projects. That would increase disposable cash for both residents and businesses alike. The city would also be in a position to stabilize electricity rates against long term utility rate hikes, reducing both uncertainty and inflation.
- 5) The city at large would benefit from the economic development of such a large project (around \$75 million), along with dozens of prevailing wage construction jobs as well as long-term management jobs, among other similar benefits. These same dollars often circulate 2-3 times throughout the city, bringing additional multiples in economic benefits. That's the key to local community power.
- 6) The electricity supply within the city would become more resilient from ample energy storage on site. Because the energy storage is local, the entire city would be subject to fewer blackouts, energy disruptions, or summer price hikes. This is literally the city determining its own stable and resilient energy future.
- 7) The electricity supply within the city would also become safer. Local energy storage reduces peak transmission line usage, resulting in a lower likelihood of

wildfires from nearby transmission lines. This will shift the city fire services away from imminent risks and into a stronger preventative posture.

Maerkle Reservoir Specifics

1. Solidify Carlsbad's long term leadership in the area of clean energy
2. Fulfill the city's Climate Action Plan's intended use for Maerkle Reservoir
3. Generate safe and resilient clean energy within the City of Carlsbad
4. Decentralize power generation away from distant, disconnected, and monstrous entities
5. Generate power close to the end user and avoid transmission costs, transmission losses, and reduce local wildfire risks
6. Identify and reserve public lands for large local solar projects in and around the greater Carlsbad and North County region
7. Create public-private partnerships to develop clean energy projects on public lands designated for solar projects
8. Maerkle Reservoir is a prime flat, south-facing, isolated field perfect for ground mounted solar and energy storage
9. Around 25 MW of power, roughly 5% of Carlsbad usage, and around 5000 homes will be powered year round by Maerkle Reservoir alone
10. A solar project land lease for the city is the highest and best use of city land, above and beyond traditional housing development or property tax revenue
11. Earn 10% or more market returns on city equity dollars invested
12. Turn city lands into performing assets that make yearly leasing revenue as well as project equity returns
13. The power sold to city customers through the Clean Energy Alliance will be at prices that beat the local utility with ease, stabilizing long term prices
14. This a safe and liquid investment that can be sold on the open energy markets
15. Garner financial benefits from \$75 million investment, including dozens of prevailing wage jobs and management jobs, as well as economic multiples thereof
16. Equity stake for the City of Carlsbad in this project would be 10% of the project total value, which is ($\$75 \text{ million} \times 10\% =$) \$7.5 million with 10% or more returns

What's the Real Point?

For the last few years, clean energy has been the least expensive form of energy bar none. Solar power is cheaper than coal-fired power plants. Battery storage is cheaper than natural gas peaker plants. The financial motivations for switching to clean energy are settled once and for all. This is especially true in SDG&E territory, where prices are among the highest in the nation. The question becomes: where do you put the clean energy? Do you put it far away out in the desert, or do you put it nearby the end user? If you put the clean energy nearby, then you no longer experience significant transmission losses (30-50% of power in California), transmission expenses (4-12 cents per kWh extra), or transmission hazards (blackouts and wildfires), while you gain the benefits of economic development, local jobs, along with safe and resilient power for the community. That's why finding land for solar projects within the City of Carlsbad is so

valuable. Land nearby in Vista or Oceanside would work as well, as long as those cities are part of the Clean Energy Alliance. A local renewable energy solution is therefore a regional solution. We need to point out this is not a microgrid, because everything and everybody remains connected to the existing electricity grid. This is simply local electricity to avoid blackouts and wildfires, while decreasing the cost of your electricity bills at the same time.

Climate Change

Climate change is already stressing some cities in ways they did not anticipate and were not prepared for. You see various disasters on the news — floods, wildfires, droughts, storms, heat waves, etc. — and they are only getting more frequent and more intense. This is a good time to revise and upgrade city plans. What used to be rare and unpredictable will become all too common. It's better to be prepared. However, saying something like the water allocation is acceptable for the next five years does nothing for housing or energy projects designed to last 30-50 years. The longer view looks different, and perhaps a bit scarier. You can be certain things will change. And every city is much more likely to experience at least one natural disaster over those 30-50 years. So the assets and operations of the city need to be protected long term to ensure the ongoing functions of daily life.

1. Flooding events, including flash floods, are setting new records and happening more frequently. This is in part because of intense rain bombs and because of stalled storm patterns. These used to be rare, and they are becoming more common. The rates and amounts of precipitation have grown. Old flood maps are no longer reliable. So even during a drought, we can expect a few hours or days of staggering precipitation. The City of Carlsbad has potential flood zones, and may not have enough infrastructure in place to handle increased precipitation rates. The city Drainage capabilities may need to be upgraded.
2. Sea level rise will only accelerate in the next couple of decades due to record ice melting in Greenland and collapsing ice shelves in Antarctica, as well as hotter ocean temperatures that cause the oceans to swell in size. The rates of ice entering the oceans are currently exceeding predictions, and there is no known way to slow out of control melting. At the shoreline, one inch of sea level rise erodes away around 20 inches of beach, so the impact near the shoreline is surprisingly severe. Stronger ocean storms can then tear down beach structures and attack beach cliffs more easily. Shorelines are in peril and cliffs can be expected to crumble. Houses, train tracks, and roads will face new and increased hazards moving forward. Protective measures and new traffic patterns will be needed.
3. Heat waves will only get more intense and more frequent. Hot weather is apparently the biggest climate killer and heat waves the most readily attributable to climate change. Heat waves will drive people inside with higher air conditioning loads on the local electricity grids. If local clean energy projects are not installed nearby, you can expect increased wildfire frequency from overloaded and overheated transmission lines. Even living near the ocean will no longer protect cities with a cool ocean

breeze, as used to be the case. Instead, high pressure systems will sit offshore and bake millions of people. Extreme fire hazards will persist for one or more weeks.

4. The drought in California is predicted by climate change models to continue and only get worse. The current water situation is just the beginning. Having the highest priority on Colorado River water and being a city that is a “drop in the bucket” will mean nothing 10-20 years from now. If there is no water, there is no water. Water rights or city size won’t matter. A longer-term planning time horizon is needed to keep the water flowing for decades into the future. Water is life. The city needs to secure the sources of that water sooner rather than later, before scarcity sets in or prices climb too high. Ongoing drought will also increase all sorts of fire risks.

Contact

We welcome any questions or comments you may have. Please feel free to contact us and discuss any of these matters. We can also assemble public materials and scholarly references on any of the subjects above.

Sincerely,

A handwritten signature in black ink that reads "Phil Watts". The signature is written in a cursive, flowing style.

Dr. Phil Watts, CEO
Resource Renewable Energy, Inc.
www.resourcerenewables.com
Cell: 562-607-2132

Maerkle Reservoir Solar Project

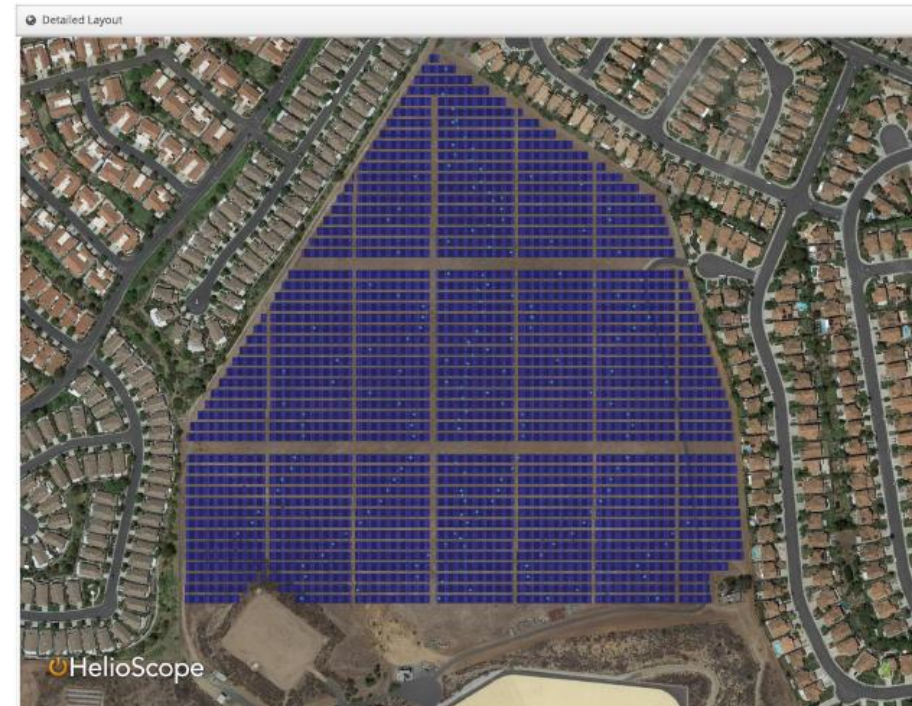
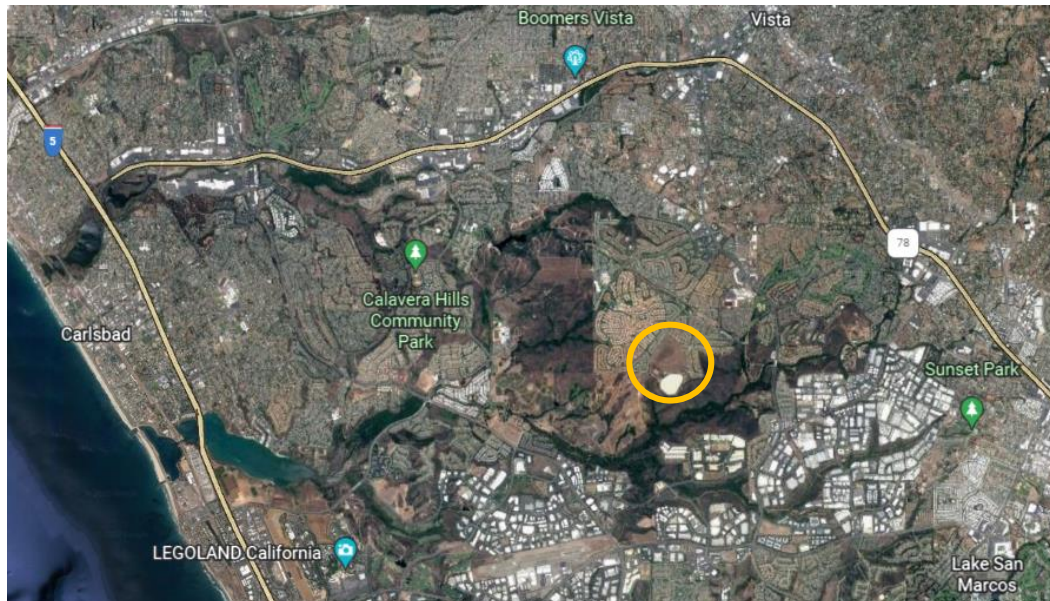


City Benefits:

- \$75 million in local economic development
- Prevailing wage construction and other jobs
- Climate Action Plan and leadership success
- Local resiliency for the Clean Energy Alliance
- Safer power grid with lower forest fire risks
- Yearly revenue from solar project land lease

Community Benefits:

- Clean energy to power 5000 homes all year
- Lower energy bills and stabilized energy prices
- Fewer blackouts and electricity disruptions
- Home grown solution being managed locally



Bringing Safe and Resilient Power to Carlsbad