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CITY OF GRAND RAPIDS AGENDA ACTION REQUEST

DATE: August 27, 2019

TO: Mark Washington, City Manager

COMMITTEE: Committee of the Whole
LIAISON: Mark Washington, City Manager

FROM: Alison Sutter, Sustainability Manager
 Executive Office

SUBJECT: City of Grand Rapids Energy Performance Update

The Office of Sustainability will provide the Commission with a presentation on the background, current state and future initiatives of our City’s energy performance and work. This presentation will be specific to the energy consumed by our City operations, including our facilities, utilities and fleet, and will focus on:

- The total amount, type and cost of energy consumed
- An overview of the components of a 100 percent renewable energy strategy
- Why efficiency is so important and how our energy efficiency is measured
- How much solar we could install on seven City facilities and the costs and benefits of solar installations on these facilities
- An overview of updated estimates on how much electricity could be generated via solar at the Butterworth Landfill and the process for issuing a Request for Proposal

The presentation will conclude with a summary of future

Prepared by Alicia Bernt

CORRECT IN FORM

 DEPARTMENT OF LAW

RANK

38 / 75

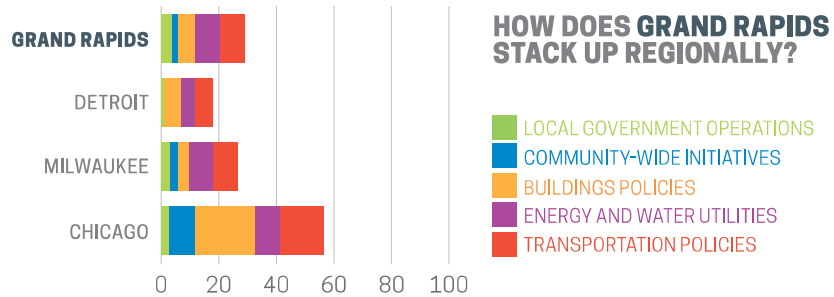
2019 CITY CLEAN ENERGY SCORECARD

Grand Rapids

OVERALL SCORE

29 / 100

Grand Rapids performed best in the energy and water utilities category. The city's score was mostly due to Consumers Energy and DTE Energy efficiency savings, their low-income and multifamily offerings, and the participation of both utilities in the Energy Advisory Committee. New policy activity over the last two years helped the city's score in the buildings policies category; in 2017, the city began offering property assessed clean energy (PACE) financing for commercial and multifamily buildings to fund energy efficiency, renewable energy, and water efficiency projects. Grand Rapids can improve its rank and performance across all policy areas, but particularly in local government operation, community-wide initiatives, and transportation policies



LOCAL GOVERNMENT OPERATIONS (4 OF 9 POINTS)

Grand Rapids has renewable electricity and greenhouse gas (GHG) emissions reduction goals for local government operations. ACEEE does not currently project that the city will achieve its goal of reducing GHG emissions 25% from 2009 levels by 2021. The city benchmarks all municipal buildings in Portfolio Manager. It also has incorporated fuel-efficient vehicles into its fleet. Grand Rapids can ramp up its efforts by setting an energy-reduction goal, converting streetlights to LEDs, and establishing a comprehensive retrofit strategy for municipal buildings.

COMMUNITY-WIDE INITIATIVES (2 OF 16 POINTS)

Grand Rapids' 2030 District sets a goal to reduce energy use in the downtown area 50% by 2030. To inspire future clean energy efforts, the city can set community-wide GHG reduction, energy-savings, and renewable energy goals. It can take steps to achieve these goals by involving marginalized communities in planning and implementing initiatives and by supporting clean, efficient distributed energy systems.

BUILDINGS POLICIES (6 OF 30 POINTS)

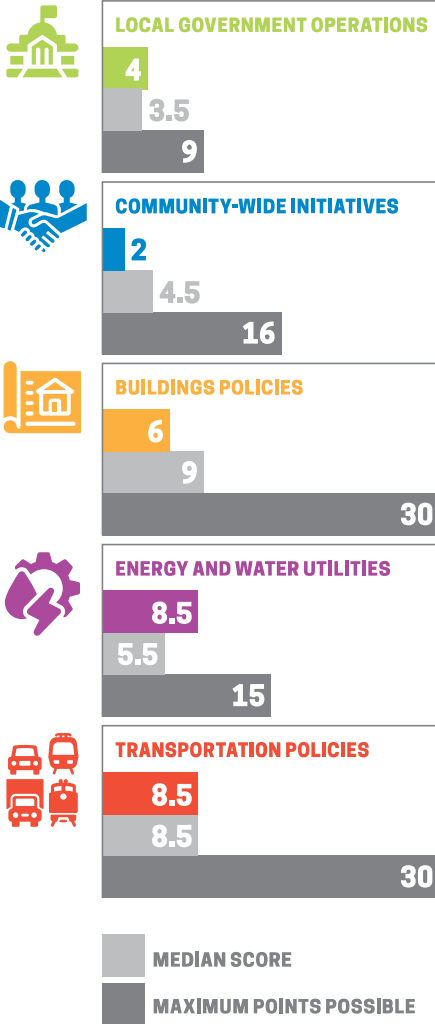
Michigan requires all jurisdictions to comply with state-mandated codes. While Grand Rapids cannot adopt its own building energy codes, it can work to improve the efficiency of its buildings by advocating for more stringent energy codes. The city encourages energy efficiency upgrades in existing buildings through its PACE financing program. The city could further encourage efficiency upgrades in existing buildings by implementing a benchmarking and transparency ordinance, passing policies that require energy-saving actions, and building an equitable clean energy workforce through training programs and inclusive procurement policies.

ENERGY AND WATER UTILITIES (8.5 OF 15 POINTS)

Compared to other utilities, Consumers Energy shows moderate savings for electric efficiency programs while DTE Energy shows high savings for natural gas efficiency programs. Both utilities offer comprehensive programs for low-income and multifamily households, and both sit on the city's Energy Advisory Committee to stay at the forefront of the city's energy work. Grand Rapids is also taking steps to encourage decarbonization; this includes submitting comments to the Public Utility Commission. Grand Rapids also works to increase energy efficiency in water services and wastewater treatment plants, but more could be done.

TRANSPORTATION POLICIES (8.5 OF 30 POINTS)

The Green Grand Rapids Report and Vital Streets Plan set a sustainable transportation vision for the city, though Grand Rapids has not adopted quantitative vehicles miles traveled (VMT) or transportation-related GHG emissions reduction goals. The city set a mode shift target to increase walking, biking, transit, and ridesharing trips to 50%. Relative to other city systems, Grand Rapids' transit system is underfunded and somewhat accessible. The city's form-based code includes several transit-oriented development provisions and requires street connectivity. The city also eliminated minimum parking requirements for downtown and transit-oriented development districts. The city can bolster its location-efficient policies by abolishing minimum parking requirements citywide and offering a greater number of incentives for compact and mixed-use development.



Attachment: attach3 (Grand Rapids Energy Performance Update)

MEMORANDUM

CITY OF GRAND RAPIDS

DATE: August 22, 2019

TO: Mark Washington, City Manager, Doug Matthews, Assistant City Manager and Eric DeLong, Deputy City Manager

FROM: Alison Sutter
Sustainability and Performance Management Officer

SUBJECT: City of Grand Rapids Energy Performance Update

The City of Grand Rapids has been committed to energy efficiency and renewable energy for nearly fifteen years. While the City's commitment to energy work took the spotlight in 2005 with our first renewable energy goal (20%), our departments, including Facilities and Fleet, Environmental Services, Parking, Water, Libraries (although GRPL is not owned or operated by the City, they are a partner in our energy work and are included in this energy performance update) and Fire, have continuously worked to implement cost savings and energy reduction programs throughout our operations, predominantly through asset management.

The City's Strategic Plan addresses reducing carbon emissions and increasing climate resiliency in objective one of the Health and Environment section. Strategies include creating carbon reduction goals, reducing the carbon footprint of City operations (buildings, utilities and fleet) and assessing the feasibility and cost of offsetting 100% of our City electricity with renewable sources by FY2025. Reducing the amount of energy we consume in our City's operations and increasing our renewable portfolio will result in:

- Decreased operational costs
- Decreased greenhouse gas (GHG)/carbon emissions
- Increased air quality resulting in decreased public health and community impacts
- Stimulating job growth in the green energy sector
- Leading by example

The work and accomplishments discussed in this memorandum are attributed to our Energy Team, which is a cross-departmental team of staff focusing on energy work throughout City operations, and the [Energy Advisory Committee](#), which is a committee of diverse community stakeholders representing business, environmental organizations, community non-profits, academia and governments.

2018 Energy Consumption and Costs

In 2018, the City paid \$9.3 million and consumed 427 million kBtu (1 kBtu equals 1,000 British thermal units; energy consumption includes the fleet, but costs do not) of energy via 335 utility accounts at 200 sites. The greatest energy source we used was electricity (60%), followed by natural gas (18%), fuel (17%) and steam (5%). Of the \$9.3 million, nearly all of it (91%) was spent on electricity (we use more electricity and electricity costs more than natural gas and steam).

Our water utilities accounted for 51% of 2018 consumption. This large consumption is due primarily to the electricity needed to pump and treat the water. The Water Resource Recovery Facility (WRRF) consumed 19% and the Lake Michigan Filtration Plant (LMFP) consumed 18%. An additional 11% of our consumption came from other water facilities (pump and lift stations) and 3% was consumed by other waste water facilities. The remaining energy was consumed by Fleet (17%), Facilities (11%), Streetlighting (10%), Libraries (5%), Parking (3%), Fire Stations (2%) and Parks and Recreation (1%).

Renewable Energy Goal and Performance

In 2005, the City announced a 20% renewable energy goal for City operations. The City achieved that goal one year early in 2007, predominantly through the purchase of renewable energy credits (RECs). The City then increased the goal to 100% by 2020. Grand Rapids was one of the first cities to adopt a 100% renewable energy goal. In 2016, the City extended the goal deadline to 2025. Our goal is for City operations only versus a community-wide renewable energy goal, which includes electricity supplying all residents and businesses in the city in addition to city operations.

The trend is transitioning from renewable energy goals specific to city operations only to community-wide renewable energy or carbon reduction goals. Many cities that adopt community-wide renewable energy or carbon reduction goals also operate their own municipal electric utility. The Sierra Club has identified 133 cities (including Traverse City and Petoskey), 11 counties, 7 states, Washington D.C. and Puerto Rico that have committed to [community-wide goals to transition to 100% clean, renewable energy](#) no later than 2050. Six cities have already met this goal: Aspen, CO, Burlington, VT, Georgetown, TX, Greensburg, KS, Kodiak Island, AK and Rock Port, MO (these cities are all under 65,000 residents and all, but one, owns their own electric utility).

The City is currently offsetting 34% of our electricity with renewable sources (21.4 million kilowatt hours (kWh)). Our renewable energy comes from RECs we purchase from Consumers Energy (26.2%), Consumers Energy's state required renewable portfolio (7.4%) and our small solar array at Oak Industrial (0.2%). Our REC contract with Consumers Energy is slated to expire in December, but we have the option to continue it if we choose.

Renewable Energy Strategy

There are two primary methods to achieving our renewable energy goal. First, reduce the amount of energy consumed via energy efficiency and second, source renewable energy for the energy consumed. Investing in energy efficiency has the greatest return on investment and should be a key focus area. Staff is evaluating the extent to which the following five actions will support achieving 100% renewable energy and at what cost:

- Consumers Energy's increased renewable energy portfolio
- Energy efficiency
- Solar
- Biodigestion
- Renewable Energy Credits

Consumers Energy

State law required Consumers Energy to source 10% of their electricity generation from renewable sources. If the City did nothing else, then 10% of our electricity consumption would be from renewable sources due to Consumers fuel mix. In Consumers Energy's recent Clean Energy Plan, they committed to sourcing 90% of their energy (for electricity generation) from clean sources, including wind and solar, by 2040. The Office of Sustainability is working with Consumers Energy to understand how much of their fuel mix they project will be supplied by renewables in 2025 to align with our goal. We will make progress on our goal based on Consumers Energy progress on their goal.

Energy Efficiency

The City does not need to source renewable energy for energy that we do not need to consume. Energy efficiency should always be a first priority as it reduces costs and the return on investment is nearly always faster and greater than other strategies. The City has consistently implemented energy efficiency practices over the years, including:

- Lighting upgrades (facilities, parking ramps and fire stations)
- Geothermal systems at Leonard and Kalamazoo Fire Stations
- High efficiency windows (City Hall and fire stations)
- Energy savings contracts at the WRRF and LMFP
- Heating, ventilation and air-conditioning (HVAC) improvements (Police Station, 509 Wealthy, Development Center, City Hall, Covell Fire Station)

Using weather normalized energy measurements normalizes how much energy is consumed each year regardless of weather variations (really hot summers equal more air-conditioning, which equals more electricity consumption). To properly identify whether energy efficiency improvements have resulted in reduced energy consumption and cost, we must compare annual weather normalized energy consumption versus a baseline year.

The City's weather normalized energy baseline is 440 million kBtu. The baseline year is predominantly 2015 although some of our facilities have been tracking data back to

2005 and we used the most historic year of data available for each facility to calculate an aggregated baseline for the entire City. When comparing 2017 to our baseline, the City reduced weather normalized energy consumption by 8.8%, which at today's rates equals approximately \$800,000 in annual savings. In 2018, our weather normalized energy consumption actually increased by 3.0% compared to 2017 and therefore is only a 5.3% reduction compared to our baseline.

This increase is due predominantly to increased energy consumption at our water utilities. Weather normalization does not work as well for water utilities because weather variations impact energy consumption differently for utilities than traditional office facilities. In addition, our water utilities have seen a growth in customers that results in a growth in energy consumption. Staff are continuing to evaluate the data to normalize for growth in customer demand and identify the best opportunities for additional energy efficiency investments. The conversion of our streetlighting to LEDs will also result in a decrease in electricity consumption.

Two external organizations evaluate how efficiently we are operating our facilities, U.S. EPA's Energy Star program and the American Council for an Energy-Efficient Economy (ACEEE). In 2018, six of our facilities earned Energy Star Certification. Energy Star Certification requires that a facility enter 12 months of energy data and earn a score of 75 or greater on a 100-point scale. Based on the most recent data we have from the U.S. EPA, the City of Grand Rapids is a leader in receiving Energy Star Certifications for municipal facilities. We are currently in the process of certifying three of these facilities again for 2019. The facilities that earned Energy Star Certification in 2018 are:

- 1120 Monroe (97, in process for 2019 certification)
- Police Station (94, in process for 2019 certification)
- 601 Ottawa (94 in 2018; we sold the building)
- 201 Market (89, in process for 2019 certification)
- 509 Wealthy (81 in 2018; unsure why the decrease, but not eligible for 2019)
- City Hall (78 in 2018; due to intensive HVAC renovation, not eligible for 2019)

ACEEE publishes a [City Clean Energy Scorecard](#) that ranks the largest U.S. cities on what they are doing to save energy in five key areas (local government operations, community-wide initiatives, buildings policies, energy and water utilities, and transportation policies). For their 2019 report, they expanded the scope of the report and included the top 75 largest U.S. cities and this was the first year Grand Rapids was included. Grand Rapids ranked 38th out of 75 and was the highest ranked city in Michigan. On a 100-point ranking scale, we earned 29 points (Boston ranked 1st with 77.5). Grand Rapids is one of the smallest cities included in the scorecard. We scored better than the median for local government operations and energy and water utilities (due primarily to Consumers Energy and DTE's activities, including participation on our Energy Advisory Committee). ACEEE identified community-wide initiatives and building policies as the greatest areas of opportunity for improvement.

The ranking was based on information submitted last December. The [Grand Rapids summary](#) identifies the following recommendations for making improvements that we have already begun or will begin very soon:

- Setting an energy-reduction goal for City operations
- Converting streetlights to LEDs
- Establishing a comprehensive retrofit strategy for municipal buildings
- Setting community-wide GHG reduction, energy-savings and renewable energy goals
- Advocating for more stringent energy codes
- Increasing energy efficiency in water services and wastewater treatment plants

Solar

In 2012, the City installed a small solar array at our Oak Industrial facility that generates approximately 110,000 kilowatts per year (0.2% of total electricity). Anyone can view the [performance of the solar array](#) on the internet. In March of this year, we joined [SolSmart](#) in partnership with the National League of Cities. SolSmart recognizes cities, counties and regional organizations for making it faster, easier and more affordable to go solar. Through SolSmart, cities can earn bronze, silver or gold certification. There are currently 275 designees nationwide with Ypsilanti being the only Michigan designated community (they earned Gold in 2017). Our participation in SolSmart is focused in two areas. First, analyzing where it makes sense to install solar on our own facilities (technically and economically) and second, assessing our regulations and processes for residents or organizations that want to install small solar applications.

Through SolSmart, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) completed a techno-economic assessment of solar for the following eight City facilities in July of this year: City Hall, Police Station, LMFP, WRRF, Market Avenue Retention Basin, Butterworth, DASH Lot 9 and the Bridge Street Fire Station. The assessment revealed that we have the space at these facilities (excluding Butterworth, which is treated separately) to install approximately 4,384 kilowatts (kW) of solar that would generate approximately 3.9 million kilowatt hours (kWh) per year of renewable energy. The solar installations vary in size from 68 kW for City Hall to 2,090 kW (a combination of carport, ground mount and roof mount) at the LMFP. If installed, this would increase our renewable performance to approximately 40%.

In July, NREL presented an economic analysis of solar installations for these seven facilities that indicated that it would cost the City more money to construct and operate solar than the City would ever save. However, the Office of Sustainability met with Consumers Energy, members of the Energy Advisory Committee and a solar developer experienced in Michigan solar installations today and discovered that the information used to generate the economic assessment was incorrect. Although the Office of Sustainability worked with Consumers Energy to confirm the information used for the model, we were unknowingly using different definitions of "total consumption." The misalignment of this key term renders the results of the NREL economic assessment inaccurate.

The Office of Sustainability and Consumers Energy are committed to correcting this error and will work together with NREL to rerun the economic analysis and will share those results with the Energy Advisory Committee as soon as they are available. We believe that the results of the corrected model will show that installing solar on some of our City facilities is economically viable.

In addition, Consumers Energy will be filing a rate case in January of 2020 with a program for distributed generation that will replace net-metering. The Office of Sustainability, members of the Energy Advisory Committee and Consumers Energy are discussing innovative ways the City can collaborate with Consumers Energy to help achieve the City's energy goals. This group intends to report out on possible opportunities at the October Energy Advisory Committee.

Butterworth update

In 2015, the City issued and awarded a Request for Proposal (RFP) for solar at Butterworth, but the company went bankrupt. The renewably generated electricity was intended for use at the WRRF. The biodigester, which began after the solar RFP fell through, will use natural gas as a fuel input to generate biogas and electricity via combined heat and power. Therefore, the WRRF will purchase significantly less electricity and is no longer a suitable off-taker of solar generated electricity at Butterworth.

NREL estimated that a 14 megawatt (MW) solar array could be installed at Butterworth that would generate approximately 17.8 million kWh. Consumers Energy previously estimated that 17.5 MW of solar could be installed that would generate approximately 25 million kWh. Both of these exercises were desk analysis and a more thorough assessment needs to be completed to conduct a more accurate cost benefit analysis.

The Office of Sustainability is working to finalize a Memorandum of Understanding (MOU) with Consumers Energy regarding our desire to generate electricity at Butterworth via solar and place the electricity on our Primary Circuit. The Energy Advisory Committee supports issuing an RFP for solar at Butterworth. The Office of Sustainability intends to issue an RFP this Fall after the MOU is complete.

Review of solar in zoning ordinance

The second area of focus for our SolSmart participation includes assessing our regulations and processes for residents or organizations that want to install small solar applications. In partnership with the National League of Cities, we feel confident we currently meet the requirements for silver certification. To meet silver, our Planning Department reviewed and acknowledged receipt of a Zoning Review, our Development Center updated the online permitting checklist and our entire inspections team participated in a solar training.

Our current zoning ordinance states that solar panels shall not be located on the street-facing side of a residential dwelling. But the ordinance also provides for an administrative departure if certain requirements are met. Before 2017, we only received between one and four solar electrical permit requests per year. Starting in 2017, those numbers have increased to 12, 25 and 21 for 2017 through 2019 year to date, respectively. With the growth in solar permit requests and our commitment under the Zero Cities Project to support our residents, businesses and organizations achieving zero net carbon, we need to review if and how we can remove barriers to solar installation. The Office of Sustainability is scheduled to solicit feedback from the Planning Commission on the SolSmart assessment in partnership with the Planning Department at the October 10 Planning Commission meeting. The Office of Sustainability will provide an update to the full Commission after that meeting.

Biodigestion

The biodigester under construction at our WRRF will generate renewable natural gas (RNG) once constructed and operating. This RNG can be sold on the market or used onsite as a renewable source of fuel for the WRRF. The short-term plans for the RNG are to sell it to The Rapid as a source of clean, renewable and locally produced RNG. There is a possibility that the RNG generated at the WRRF could be used as a renewable source of electricity in the future and Staff are working to understand how much this could contribute toward our renewable energy goal and the economics of this option.

Renewable Energy Credits (RECs)

Purchasing RECs is one method for achieving a 100% renewable energy goal and while it can be the easiest and fastest approach to reaching the goal, environmental advocates are often opposed to this approach. Any organization can purchase RECs on the national market at a fairly low price at this time. The criticism of this approach is threefold. First, purchasing RECs from existing renewable projects (typically wind or solar) does not increase the amount of renewable energy being produced – it's not additive, it's merely taking advantage of something that currently exists. Therefore, it's not helping reduce the amount of carbon currently being generated. Second, it's not helping stimulate the local economy. Those projects are often located outside of Michigan. Third, the environmental benefits realized by renewably generated energy, such as cleaner air and water, are not realized locally.

We are currently purchasing 16.6 million kWh of renewably produced electricity from Consumers Energy annually via our Green Generation contract at a cost of \$116,348. This contract was signed in December of 2013 and expires this December. This accounts for 26% of our renewable portfolio. The cost of this contract is divided evenly between the Water and Environmental Services departments. Consumers Energy has offered to extend the contract beyond December with these two accounts if the City desires to do so. Consumers Energy is also in the process of developing a new program for customers interested in purchasing RECs and anticipates that program will be available this fall.

The City can purchase clean wind RECs on the national market quickly, easily and at a fraction of the cost of purchasing RECs through the Green Generation program. The cost to purchase one kWh via the City's Green Generation program is \$0.007/kWh (this is in addition to the cost of electricity). Clean wind RECs are currently estimated at approximately \$0.001/kWh on the national market (also in addition to the cost of electricity). The Office of Sustainability will continue to evaluate how RECs will be a part of our 100% renewable energy strategy. RECs will almost certainly be a component, but we are working to leverage energy efficiency and onsite solar opportunities first.

There are many moving pieces to the City's energy consumption and equally as many options to achieve the City's 100% renewable energy goal. These options come at a variety of price points, payback periods and benefits. After solar RFPs are returned for Butterworth, the Office of Sustainability will present a renewable energy strategy that includes different options at different price points and accomplishes our 100% renewable energy goal by 2025.

The City's Greenhouse Gas/Carbon Footprint

When analyzing an organization's carbon footprint or conducting a greenhouse gas (GHG) analysis, it is standard to report on emissions via metric tons of carbon dioxide equivalents (MTCO_{2e}). The most common GHGs include carbon dioxide, methane and nitrous oxide and each has a different impact. Converting all GHGs to MTCO_{2e} allows for the calculation of total carbon via a carbon footprint.

The City's 2018 carbon footprint was 56,691 MTCO_{2e} (this metric was updated after the Strategic Plan was published). Our carbon emissions come predominantly from the energy we use in our buildings and utilities (electricity, natural gas and steam) as well as the fuel we consume in our fleet. The electricity we consumed in 2018 accounted for 77% of our carbon emissions followed by fuel for our fleet (12%), natural gas (9%) and steam (2%). Many communities are focused on developing carbon reduction goals in alignment with the Paris Climate Accord, which encourages organizations to reduce carbon emissions by 80% by 2050 in comparison to a 2005 baseline.

Future Initiatives

Over the next six months, the Office of Sustainability will work with the Energy Team and Energy Advisory Committee to:

- Issue an RFP for solar development at Butterworth and update NREL's solar assessment of the City's seven facilities
- Identify how many RECs, from where and at what cost the City should purchase
- Continue developing an LED streetlighting strategy
- Create a 100% renewable energy strategy
- Present to the Planning Commission and the full City Commission options to consider for amending how our zoning ordinance currently treats small scale residential installations
- Provide an update to the City Commission on community-facing energy and carbon reduction initiatives, including Zero Cities Project and the GR2030 District