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The NextGen Energy Program

Energizing Our Campus.
Securing Our Future.
Strengthening Our Resiliency.

The NextGen Energy Program (NextGen) is a plan to

Replace, Renew & Modernize

the University of Maryland, College Park's aging energy system.

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55,000+

Students, Faculty & Staff

250+

Campus Buildings

The University of Maryland is a small city unto itself.

NextGen will ensure that our College Park campus has **reliable, efficient and affordable energy services** for decades to come.

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NextGen is a

Path to Our Clean Energy Future

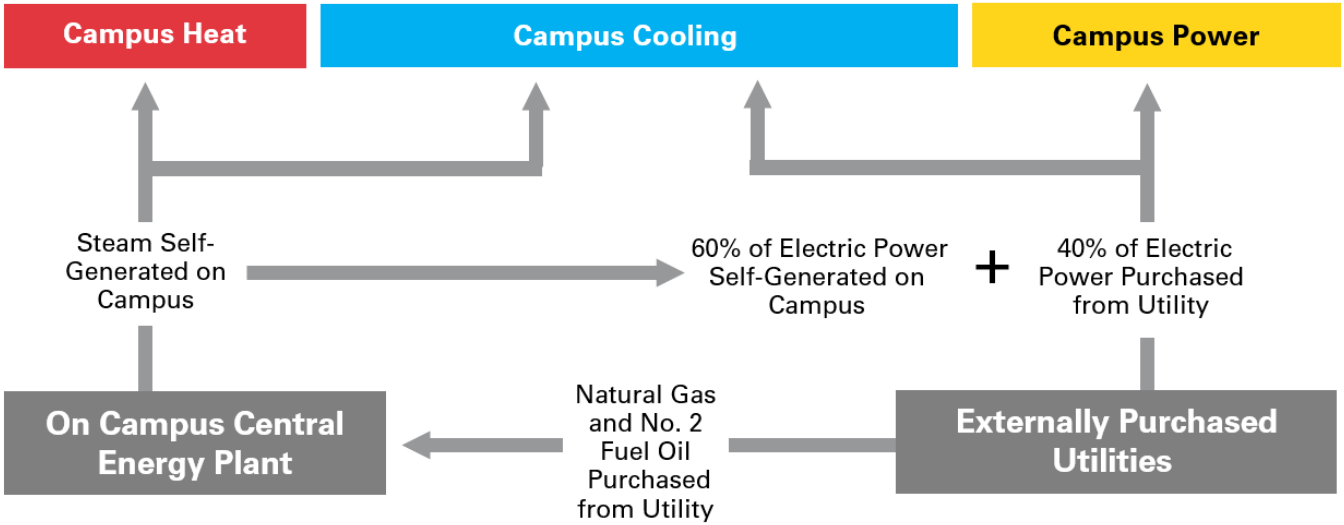
The NextGen Energy Program will serve as a platform to meet our critical UMD-wide sustainability goals for energy production and usage.

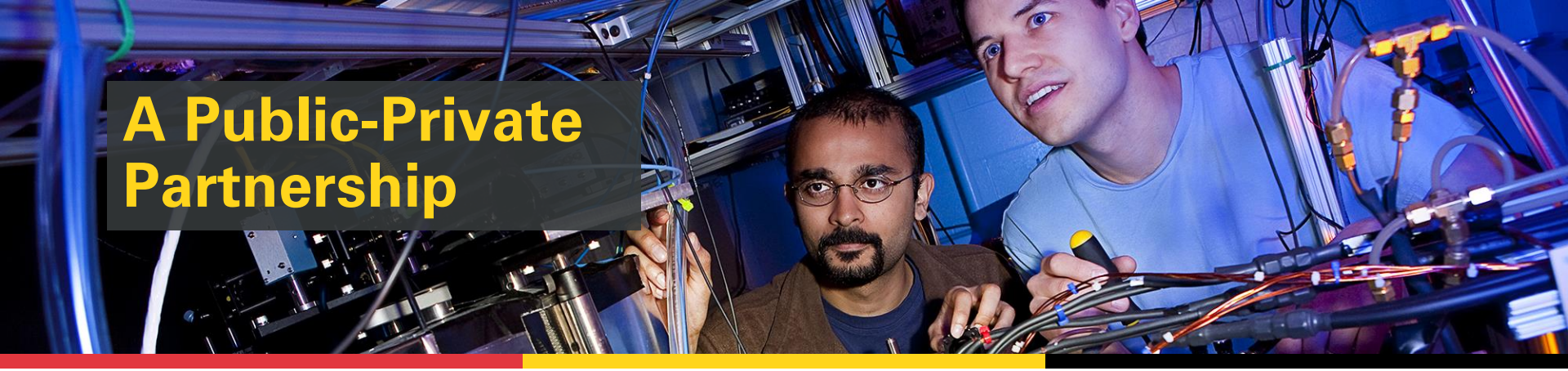
- **Improved operational efficiency and water recycling and decreased energy loss**
- **Flexibility to incorporate low- and zero-emission fuel options in the future**
- **Integration of energy storage or other microgrid compatible technologies**
- **Energy conservation measures through enhanced controls and monitoring systems**

How Our Energy System Operates Today

In 1999, UMD successfully partnered with a private sector energy company to provide energy to our campus.

Our current system provides **heating, cooling and electric** services to campus through what's known as **"tri-generation."** This allows us to produce all three types of energy with only one fuel input, minimizing lost or wasted energy.





A Public-Private Partnership

NextGen continues the University of Maryland's 20-year, cutting-edge approach to providing creative and sustainable energy solutions through public-private partnerships (P3s).

- Under the proposed P3 for NextGen, UMD will contract with a private sector entity to design, engineer, finance and install energy system improvements.
- The entity will also manage, operate and maintain the university's energy systems moving forward.

After extensive research and evaluation, the NextGen Energy Program proposes replacing our existing energy system in a way that is consistent with our core values and best serves our community, now and in the future.

Successes of the 1999 Program

The 1999 UMD Energy Program demonstrated the power of using a public-private partnership for higher education campus energy programs

Reliably delivered long-term steam, electricity and chilled water to campus

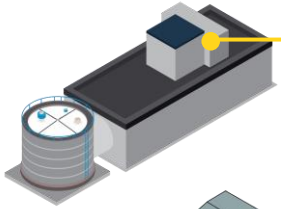
Performance requirements provided effective incentives and accountability measures

Tri-generation technology achieved environmental benefits and operational efficiencies

Onsite electric generation reduced costs and created financial benefits

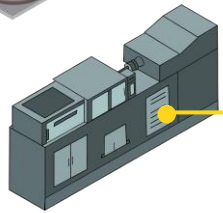
Our Aging Energy System

While UMD's energy system can satisfy current load requirements, signs of an aging system are beginning to surface, informing our need for increased reliability



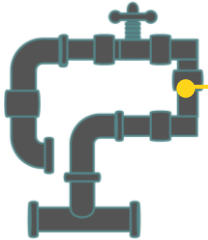
Central Energy Plant

Combustion turbines have reliability issues and frequently need repair. With lengthy standard wait times to source spare parts, the plant's reliability has significantly deteriorated.



Chilled Water System

Due to age and the type of refrigerant used, it is recommended the chillers be replaced in the near future.



Steam Distribution

90% of manholes require repairs or upgrades, and 60% of the distribution piping is over 40 years old.

Securing A Reliable Future

While the 1999 UMD Energy Program pioneered university energy solutions, the NextGen Energy Program will further advance the P3 model by prioritizing **a shared culture of continuing system improvements and innovation** with our selected partner.

Robust Due Diligence Informed the Program Procurement Strategy

Baseline Assessment: Conducted a baseline study to establish UMD's historical cost of services and energy consumption

Market Sounding: Met with 10 interested parties (operators and investors) to collect feedback on alternative technology and project delivery options as well as various procurement approaches

Service Delivery Options: Evaluated the pros and cons and financial implications of a range of service delivery options that would meet the utilities needs of campus. Options included (i) maintenance only, (ii) traditional gas fired boilers, (iii) cogen upgrade, (iv) geothermal (electrification) and (v) biomass.

D/E

Commercial Delivery Options: Evaluated benefits and risks associated with alternative commercial structures. Options included (i) 501(c)(3) not-for-profit and (ii) concession.

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Finding the Right Energy System Option for Our Campus

UMD is evaluating a range of options to provide the university with efficient energy. **Our three key considerations** when selecting an energy system are its ability to **support the university's environmental goals**, **limit campus disruption** and **serve as a prudent use of financial resources**.

Environmental Considerations

- ✓ Supports carbon reduction efforts and aligns with goals set out in UMD's Climate Action Plan
- ✓ Offers low-to-moderate complexity for environmental permitting
- ✓ Allows flexibility to incorporate efficiency programs, which will decrease the amount of energy required to power, cool and heat campus

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Campus Considerations

- ✓ Provides flexibility to meet campus expansion needs
- ✓ Limits campus disruption by minimizing construction and operating impact
- ✓ Offers more feasible implementation process in comparison to other potential options
- ✓ Improves campus resiliency by being able to adapt to changing conditions and recover rapidly from service disruptions

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Financial Considerations

- ✓ Minimizes overall lifecycle cost
- ✓ Energy system options compared based on estimated cost to build each project using today's dollar value

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Evaluation of Potential Energy System Options

Considerations	Status Quo No substantial capital investment in equipment	Boilers Replace current system with traditional gas fired boilers	Cogeneration Replace current system with new cogeneration system to provide heat, power and cooling	Geothermal Implement geothermal district energy loop to heat and cool campus	Biomass Burning a feedstock such as woodchips, supplemented by a natural gas fired boiler
Supports Carbon Reduction Efforts	▲	▲	▲	▲	▲
Moderate Complexity for Environmental Permitting	▲	▲	▲	▲	▼
Provides Flexibility for Assumed Near-term Energy Efficiency Programs	▲	▲	▲	▲	▲
Provides Flexibility for Extensive Campus Vertical Buildout	▲	▲	▲	▲	▲
Limited Campus Disruption	▲	▲	▲	▼	▼
Feasibility	▲	▲	▲	▼	▼
Improves Campus Resiliency	▼	▲	▲	▼	▲
Upfront Capital Investment	▲	▲	▲	▼	▼
Ongoing Lifecycle Costs	▼	▼	▲	▼	▼

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▲ Green = Strong alignment with goals

▲ Yellow = Medium alignment with goals

▼ Red = Low alignment with goals

A New Vision for Our Energy System

Designed to be **adaptable**, the NextGen Energy Program will allow the University of Maryland to incorporate the **high-efficiency technologies of today**, while providing **flexibility to make regular upgrades** and utilize the technologies of tomorrow.

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Three Ways NextGen Will Improve Our Energy System

1

Update the distribution system to make heating and cooling campus buildings more efficient

2

Implement measures to increase efficiency and resiliency based on available technology, cost and greenhouse gas (GHG) emissions considerations

3

Make modifications to incorporate new renewable energy sources and technologies

The final scope and approach of the NextGen Energy Program will be determined based on an evaluation of proposals from bidders that best align with the university's goals.

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Getting To NextGen: A Roadmap

Oct. 2018
Kick-off meeting held with university stakeholders and student leaders

Feb. 2019
Follow-up meeting held with university stakeholders and student leaders

Jan. 2020
Pre-solicitation report submitted to the State

Spring 2020
Approval from the State of Maryland Board of Public Works secured

Fall 2021
Competitive procurement process with shortlisted proposers occurs

Winter 2022
Private sector energy company identified to complete the work

Early 2023
Proposed transaction terms submitted to state legislative bodies and the Board of Public Works to secure approval

Fall 2023 and Beyond
NextGen Implementation
Existing system maintenance and improvements and new system construction

NextGen will continue our **legacy of achievement** as a preeminent center for **research and education**.

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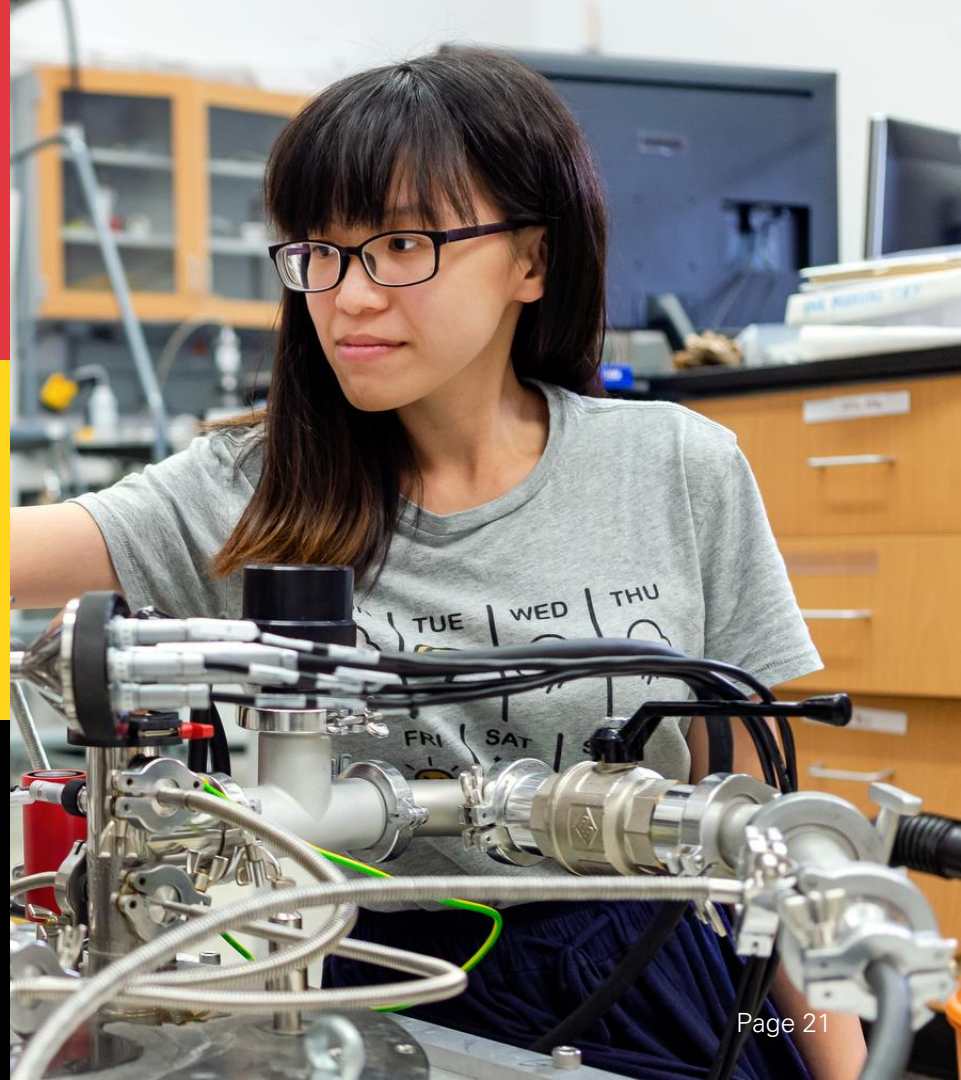
NextGen has the potential to foster new initiatives on campus.

- Groundbreaking research in collaboration with faculty and students
- Upgrades to campus facilities
- Student scholarships and internships
- New and innovative academic programs



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As the NextGen Energy Program progresses, **we are committed** to working alongside **the State**, the **university community** and other **stakeholders**.

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For more information or to contact us, visit

NextGen.umd.edu

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Working together we will replace, renew and modernize the campus energy system to:

Energize Our Campus. Secure Our Future. Strengthen Our Resiliency.

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