

# Allergan's View of the Future for Energy Management

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## ABSTRACT

Allergan has projected future energy consumption and cost, along with greenhouse gas (GHG) emissions and cost impact, from 2011 through 2020. Allergan has developed strategic visionary goals that will allow the company to reduce its energy consumption and cost as well as to significantly reduce its climate change footprint. This article presents how Allergan intends to do this and what we think the future holds.

## INTRODUCTION

Allergan embarked on a comprehensive sustainability program in 1991 when it set its first waste reduction goals and developed strategic plans to accomplish them. Membership in the USEPA Energy Star Program along with reference materials (1,2,3) produced and made available under this program have been very helpful. Formal five-year sustainability strategic plans with supporting tactical plans were first introduced in 1995. Allergan is currently in the middle of its fourth five-year plan. During the third plan, Allergan also developed a long-range ten-year visionary strategic plan that would take the company out to 2020. In this article, I will present where we see the future of pharmaceutical development going and what impact it will have on Allergan from an energy and GHG point of view.

## CHANGES IN OPERATIONS

The types of products manufactured are gradually changing. Products are trending toward targeted treatment rather than systemic

treatment. Dosages are becoming more potent and/or are being administered in smaller quantities. Time-release implantables are starting to become a reality. The decrease in the quantity of materials and the methods of delivery is lowering energy consumption. As batch sizes decline and product delivery mechanisms allow targeted treatment, the footprint required to make these products decreases significantly. This allows a decrease in energy consumption by reducing HVAC and lighting needs. These declines will be significant in our opinion. For example, our latest implantable bioerodable product Ozurdex has a time-release capability resulting in a product that is a couple of orders of magnitude smaller in size than a conventional eye drop solution. The area required to make the product has a much smaller footprint than the conventional eye drop product.

The industry is heading more and more to aseptic processing for solutions, ointments, gels, suspensions and biologics. This requires advanced restricted access barrier systems (RABS) and isolator systems which reduce or eliminate human exposure to product during the manufacturing process. This allows for greater flexibility outside the RABS and isolator systems which can bring an opportunity to reduce energy consumption and concomitant GHG emissions. The footprint for these systems is smaller than having to enclose an entire room to accomplish the same end. HVAC reductions are expected to be considerable.

## ENERGY CONSUMPTION AND COST PROJECTIONS

Allergan has projected energy consumption through 2020 along with energy costs. Figures 1 and 2 show no action (top line on each figure) and full action (bottom line on each figure) projected outcomes. No action assumes that Allergan does not act on its 2020 visionary strategic plan tactics over the period. Therefore, growth and inflation are projected to increase at an average 2.5% over the period. The full action scenario assumes that Allergan implements every energy efficiency tactical plan according to schedule. The 2.5% average increase over the period is offset by 5% annual reduction in energy consumption over the period. The no action alternative does not allow Allergan to achieve its 2020 objectives and would be extremely costly for Allergan to ignore.

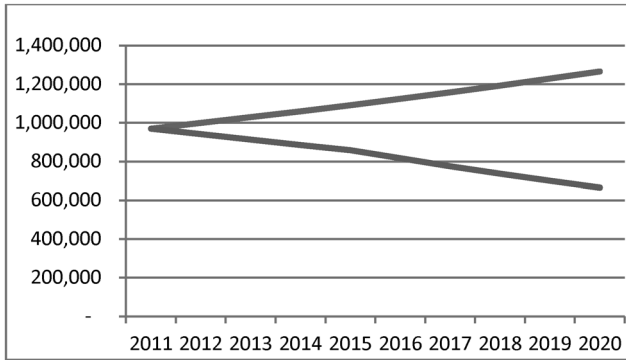


Figure 1. Allergan energy consumption projections in gigajoules

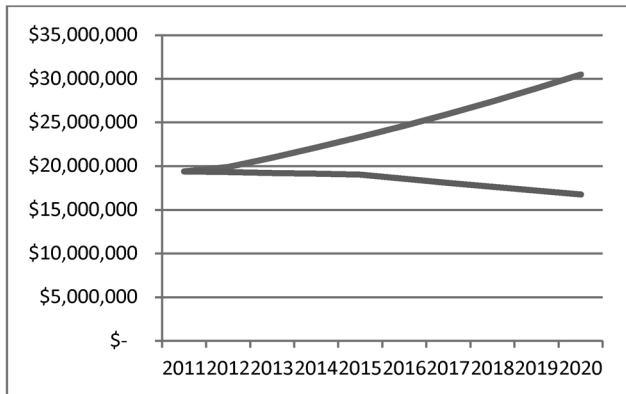


Figure 2. Allergan energy cost projections

### CARBON IMPACTS

Allergan manages carbon only at its Irish facility in Westport, Ireland. This facility has been successful at implementing an energy efficiency program that has resulted in EU allowances (EUA) to be banked in the European Trading Scheme (Figure 3). During the third phase of this program beginning in 2013 and ending in 2020, free EUAs allocated to the Allergan site will be phased out, and purchase of these allowances will become necessary. Emission allowances have not been required at any other Allergan locations and none is expected to be required through the period. Costs for EUAs have ranged between €6 and €30, so an average of this price was used to calculate costs and savings. By

2018, Allergan will be required to buy EUAs, as the banked allowances and free allocation of annual EUAs decreases over the period (Figure 4). In 2020, these EUAs are anticipated to cost Allergan nearly \$100,000. These projections assume again that Allergan implements the tactical energy conservation elements of its 2020 plan.

### SUPPLY CHAIN MANAGEMENT

Allergan has embarked on developing life cycle energy assessments to determine not only energy demand throughout a product's life cycle but also the GHG emissions associated with each stage of the

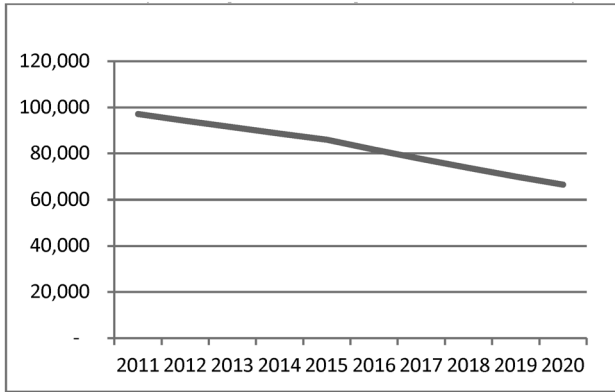


Figure 3. Allergan GHG emissions projection

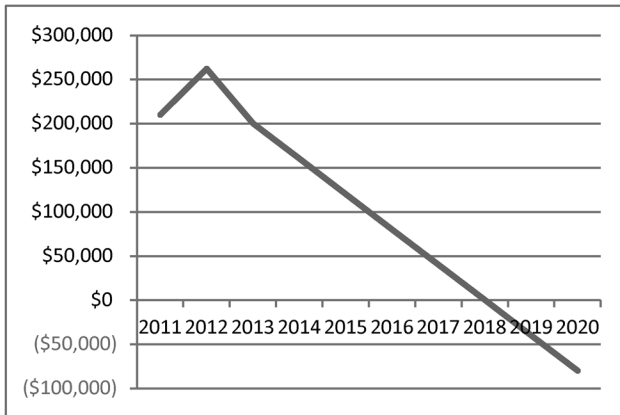


Figure 4. Allergan GHG emission credit projection

supply chain. Allergan has completed energy profiles for its own unit dose and multidose solution and suspension product lines. We are now expanding this to our other product lines.

We have completed one pilot study on an Allergan product that estimated the supply chain energy demand and GHG emissions. This study confirmed that it will be extremely difficult to develop a standard product average carbon emissions estimate that is meaningful to a consumer or customer. The number of permutations associated with various supply chain levels and sources makes it impossible to average these GHG emission estimates with any sort of precision.

However, what Allergan did determine is that our focus on our own energy consumption is the most significant way to reduce our products' overall impact on the climate change issue.

## CUSTOMER EXPECTATIONS

Customers are more frequently wanting to know if Allergan has a sustainability program; what Allergan is doing to reduce energy consumption and concomitant GHG emissions; what are the GHG emissions associated with the overall business, per product unit; and is the information supporting these estimates being third-party verified. Allergan is addressing these customer requirements by posting information and reports on its website and making these data known through various media outlets. We believe that customers have established their own internal goals, are looking to improve or maintain reputations and satisfy stakeholder interests, are managing supply chains, and may use the information to select and leverage suppliers. We have seen a number of tenders and bids including more detailed understanding of a bidder's sustainability program and performance to internal goals. We believe that this will differentiate suppliers in the future. We also find investors beginning to use sustainability data along with financial and other data to make investment decisions.

## TECHNOLOGY SHIFTS

Allergan has seen a tremendous shift in how diseases are treated and the manufacture of these treatments. Some highlights are:

- targeted disease and organ focus rather than systemic approaches,
- sustained release implantable devices and drugs,
- more potent compounds in smaller dosages, and
- more highly contained and interconnected manufacturing.

Opportunities from an energy efficiency improvement and GHG emissions reduction point of view include HVAC total requirement reductions due to smaller contained manufacturing equipment and environments, reduction in packaging components and associated equipment, and reduction in transportation due to downsized packaging. These energy reductions will be significant and will also result in large reductions of GHG emissions.

The electrical source makeup has been changing significantly over the last five years and will continue to shift toward renewable sources and away from non-renewables. Allergan has seen the renewable portfolio at its facilities go from an average of 5% to 17% globally in 2012. We believe this will increase to 30% by 2020. The technologies that are driving this are geothermal, biomass, wind, solar and small hydroelectric energy producing facilities.

Allergan's onsite sources of energy generation have been shifting toward solar, wind, fuel cells, and small and large cogeneration and tri-generation systems. These systems allow Allergan to be more efficient with the energy consumed in its operations and to reduce GHG emissions significantly. We also see battery and lighting technology becoming more innovative and energy efficient.

## CONCLUSION

Allergan's energy consumption will decrease significantly if planned tactical projects are implemented. Its GHG emissions will decrease concomitantly with energy reductions. The company will save a substantial amount of money by completing the visionary plan, and its reputation and competitiveness will become more robust. We believe that this is the right path for Allergan to follow and intend to achieve the visionary sustainability goals.

## References

1. Galitsky, C., S. Chang, E. Worrel, E. Massanet, "Improving Energy Efficiency in Pharmaceutical Manufacturing Operations," LBNL-60288, 2006

2. Facility Energy Management Assessment Matrix, US EPA Energy Star Program
3. Galitsky, C., S. Chang, E. Worrel, E. Massanet, "Energy Efficiency Improvement and Cost Savings Opportunities for the Pharmaceutical Industry," LBNL-57260, 2005

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#### ABOUT THE AUTHOR

**Michael B. Whaley** has an MSEN from USC, a BS in oceanography / zoology, and is a Professional Engineer registered in Arizona.

He worked in several large, medium and small companies in various locations worldwide over the past 35 years. He specializes in sustainability and environmental health and safety management primarily, with additional opportunities in various engineering, facilities, and security roles. He has established programs to monitor, measure, set goals, and implement projects. He has achieved sustainability targets and millions in savings.

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