Co-Funded Health-Focused Housing Intervention Measure Benefits: Establishing a Co-Funded Low-Income Residential Program Model

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ABSTRACT

An impending reduction in claimable lighting savings is forcing utility energy efficiency program administrators (PAs) to re-evaluate residential energy efficiency (EE) program implementation models, identify additional benefits sources, and reduce costs. At the same time, the health care industry is under increasing pressure to reduce costs and better manage health care demand. To address these pressures, the healthcare industry is attempting to shift their business model from a fee-for-service payment system that rewards increasing demand, to a value-based model that rewards outcomes such as demand reduction, better population health, and lower per capita health care cost.

These changes present an opportunity for the energy efficiency and health care industries to work together. Offering health-focused housing measures through established EE programs could offer PAs "co-funding" opportunities such as reduced PA costs and additional benefits while providing the health care industry with an existing and proven program delivery model and analytical framework to achieve value-based outcomes.

This paper aims to provide an overview of the changing landscapes of the EE and health care sectors and how collaboration between both sectors could result in mutually beneficial results.

Introduction

Residential energy efficiency (EE) programs are facing a future without energy savings from lighting, which has historically been the most significant and dependable contributor to electric energy reductions. This is due to the lighting efficiency standards of the Energy Independence and Security Act (EISA) of 2007 and the subsequent widespread adoption and installation of extremely efficient and long-life time light-emitting diodes (LED)s. This change is forcing a re-evaluation of program implementation models that includes an exploration of additional benefits or cost reductions. At the same time, the health care industry is undergoing changes of its own. With increasing pressure on costs and the need to better control health care demand, health care providers and more specifically entities that serve low-income Medicaid beneficiaries are taking steps to make a dramatic shift in their business model. They are moving away from a fee-for-service payment system that rewards *quantity* of health care utilizations and procedures, towards a value-based model that rewards desirable *outcomes* such as better patient experience, better population health, and lower per capita cost of health care.[1]

[1] Definition of utilization: In health care, the consumption of services or supplies, such as the number of office visits a person makes per year with a health care provider, the number of prescription drugs taken, or the number of days a person is hospitalized (Medical Dictionary, Farlex and Partners, 2009).

In the sections that follow, we aim to draw a comparison between the energy efficiency sector's 40 years of demand-side management energy efficiency program implementation with health care's nascent efforts to improve Medicaid population health and reduce spending. We will start with a high-level overview that describes how the energy efficiency sector has developed over the past forty-years starting from its birth out of the 1970's energy crises into an effective and widely accepted strategy for states and utilities to more prudently and effectively manage energy demand at less cost. We will then shift to provide a high-level current overview of the U.S. Medicaid program spending crises. We will summarize the strategies being implemented to reduce Medicaid costs and improve health through newly established incentive-based programs. More specifically, we will outline how Medicaid programs are beginning to assess ways to implement upstream population health management programs such as installing health-focused housing intervention measures in low-income households. We close by outlining the potential opportunities and challenges for energy efficiency sector collaboration with Medicaid providers to leverage its low-income program implementation structure that could allow for the integration of health-focused housing intervention measures and co-funding portions of a low-income energy efficiency program.

Evolution of the Energy Efficiency Industry

Energy efficiency has its roots dating back to the 1970's during a time when the United States was experiencing a national energy crisis. An oil embargo imposed by members of the Organization of Arab Petroleum Exporting Countries (OAPEC) led to fuel shortages and sky-high prices throughout much of the decade. Regulators and utilities were under increasing pressure from the federal government to devise solutions that contribute to reducing energy consumption.

Supported by regulatory policies that ensured utilities would be financially incentivized to reduce its energy throughput when efficiency opportunities were cost-effective, utilities began to establish energy efficiency program services and measures. Utilities started "viewing reductions in demand as a resource that could be influenced and managed within their energy supply portfolios" (Lazar and Colburn 2013). By placing demand-side management on an equal footing with supply-side management[2] (i.e., meeting energy demands by purchasing reductions in energy demand as well as produced power), utilities began to carve a pathway to value and monetize reductions in energy use. Utilities paid for demand-side management capacity because it was often cheaper and easier to procure than traditional generation. By showing that capturing energy efficiency from its customers was typically much cheaper than building additional energy supply resources, utilities and regulators began to address the inherent disincentives and market barriers to efficiency, thus, pursuing a more integrated approach to balancing demand and supply.

While the potential of energy efficiency was conceptually understood, the utility industry was not in a position to aggressively invest in this strategy because of numerous economic, regulatory, and institutional barriers. The process of overcoming those barriers began with a number of key steps to support evidence-based reasoning, including:

- Developing the quantitative tools and performing the necessary analyses to show that efficiency can often be achieved more cheaply than supply resources.

[2] Energy conservation resources even were a 10% or so cost advantage in the Pacific Northwest in the 1980s.

- Publishing studies that demonstrated both the potential for efficiency by way of specific measures and actions whose costs were analyzed and quantified as well as the benefits that could accrue to society and the economy resulting from their implementation.
- Researching the market and regulatory barriers that simultaneously prevents the economy from investing in optimal levels of efficiency while biasing resource decisions toward more costly and polluting supply-side solutions.
- Presenting research and study findings to regulators, policy makers, and utilities to demonstrate the tremendous economic net benefits that could accrue from pursuing efficiency as an energy resource, and proposing new regulatory, legal, economic, and programmatic models to facilitate such a transformation.
- Designing and implementing initial efforts to test out program concepts and best practices.

The traditional regulatory compact called for utilities to serve the public interest and pursue least-cost energy services in return for monopoly status and protected returns on investment. These research studies were able to show that the public interest was best served by pursuing energy efficiency– frequently the least cost resource–and that efficiency should be treated on an equal footing as supply-side resources. They also provided:

- An understanding of how to modify policy to create incentives and remove disincentives and barriers to a demand-side strategy;
- An understanding of the specific actions and measures that could be taken; and
- A roadmap for designing and implementing programs to capture the efficiency potential.

Energy efficiency has come a long way since its inception in the 1970s. Utilities across the United States invested approximately $7.6 billion in energy efficiency and saved approximately 25.4 million megawatt hours (MWh) in 2016. (Berg, et al. 2017) Critical components that have supported the evolution of energy efficiency as a niche solution to a critical component of the energy system include:

- Effective policies such as least-cost procurement, where the mandate is to invest in all cost-effective energy efficiency that is less than the cost of supply.
- Regulatory bodies that are able to confirm the value proposition of energy efficiency on behalf of rate payers.
- Federal and state agencies that have been grown to drive standards and best practices to maximize energy efficiency's potential.
- Utility companies and alternative program administrators that have institutionalized energy efficiency to progressively help customers with energy efficiency instead of solely selling more energy.
- The expansion of an infrastructure of energy efficiency-related service providers, building scientists, and manufacturers that deliver needed market services and products to create energy savings for customers and associated job creation.

Much like the energy industry of 50 years ago, the U.S. health care system in its present form lacks many of the institutional features that led to the evolution into a more efficient energy delivery system. The next section lays out many of the challenges currently facing health care and the strategies being developed to respond to those challenges.

The U.S. Health Care Crises

"Health care costs in the United States have outpaced costs in other parts of the world for many years" (Frakt and Carroll 2018). Many experts argue that health care spending is reaching crisis levels. "U.S. health care spending grew 4.3 percent in 2016, reaching $3.3 trillion or $10,348 per person. As a share of the nation's Gross Domestic Product, health spending accounted for 17.9%, more than 1 out of every 6 dollars. Total health spending is projected to grow 1.1 percent per year faster than Gross Domestic Product (GDP) through 2024, increasing the health spending share of GDP to almost 20 percent" (Centers for Medicare and Medicaid 2018). Approximately one-third of annual health care expenditures in the U.S. serve low-income and near-low income families through Medicare, Medicaid and the Children's Health Insurance Program (CHIP). "Program expenditures show persistent annual growth" (The Henry J. Kaiser Family Foundation 2016). "Medicaid spending grew 3.9% to $566 billion" (Centers for Medicare and Medicaid 2018)."The coverage expansions and premium subsidies included in the Affordable Care Act (ACA), together with an aging population, will require federal, state and local governments to finance nearly half of all health spending by 2024" (Centers for Medicare and Medicaid 2018). Clearly, the United States can benefit greatly from lowering health care spending.

The ACA, passed in 2010, was designed to encourage health care providers and payers to begin making a dramatic business model shift away from a fee-for-service payment business model that rewards the quantity of health care utilizations and procedures performed to a value-based model that rewards three desirable outcomes: improved patient experience of care, improved health of populations, and reduced per capita cost of health care. In the words of the American Health Association, "The increasing rates of chronic disease and the change to a value-based reimbursement system are among the demand and performance forces pressing organizations to take a more proactive approach to patient care—that is, reaching out to the population beyond the traditional four walls of the hospital. A value-based payment business model commands that organizations examine how to

What is an ACO?

One way that health care providers are implementing this new business model is by establishing Accountable Care Organizations (ACOs), of which more than 430 currently exist in the United States. As explained by the Commonwealth Fund, an (ACO) is an entity formed by health care providers—from primary care physicians and specialists to hospitals and post-acute care facilities—that agree to collectively take responsibility for the quality and total costs of care for a population of patients. More importantly, they are also responsible for the total costs of providing this care. Under the ACA's new Medicare Share Savings Program, ACOs that control spending for Medicare patients below budget have two methods to share the savings. If participating ACOs meet quality benchmarks and keep spending for their attributed patients below budget, they receive half the savings that result, with the rest going to the Centers for Medicare and Medicaid Services (CMS), which administers the program. To keep a larger share of the savings (up to 60 percent), ACOs can choose to participate in a "two-sided risk" model, whereby they must repay a share of losses if health care spending for attributed patients exceeds the budget target.

manage the health of their patient populations to improve outcomes."(Health Research & Educational Trust 2012).

Several system reform mechanisms have been developed and are being used to align financial incentives with the goals of a value-based strategy. These include creating and implementing incentive models such as Accountable Care Organizations (ACO), bundling services and payments for episodes of care, patient-centered medical homes (PCMH)[3], and additional smaller pilot initiatives supported by the Centers for Medicare and Medicaid Innovation (CMMI)[4].

"While the ACA provides revenue-enhancing incentives for providers to reduce costs, it remains a challenge to identify those cost-saving strategies and programs that can demonstrably achieve these savings" (Freedman 2018). There are a wide range of programs that aim to reduce health care costs for Medicaid Providers and Payers, from 'downstream-focused' programs such as coordinated care which deliberately organizes patient care activities and shares information among all of the participants concerned with a patient's care to achieve safer and more effective care. Others include electronic health records to more efficiently manage patient care and upstream Population Health Management (PHM) programs ranging from home education visits, smoking cessation, and health-focused housing intervention measures to prevent health issues from occuring. PHM is the iterative process of strategically and proactively managing clinical and financial opportunities to improve health outcomes and patient engagement, while also reducing costs (Kindig 2015). PHM strategies are a relatively nascent but growing strategy for health care providers and payers. These strategies offer a potentially cost-effective and less-expensive means to reduce and control health care demand and costs.

Initial PHM research looks promising. "Five years ago upstream PHM programs and tools were scarce. But more recently, they've quietly been arriving on the scene, driven in part by imaginative new approaches to what we should be measuring, and how. If these approaches work, they could start changing not only our policy conversation, but the politics around it, offering hard-headed evidence of savings that Republicans could get behind as easily as Democrats" (Freedman 2018).Though showing promise, integrating upstream PHM programs into Medicaid incentive programs still faces many challenges. A recent American Medical Association report[5] focuses on addressing the need for a "population health care road map" for health care providers and payers. The report outlines several challenges for health care providers seeking to implement PHM programs. In particular, it expresses that hospitals seeking to invest in PHM programs that reduce health care demand and costs will need the most help with aligning payment to support population health work, developing and training a workforce with the skills needed to address the social determinants of care, and developing IT analytics systems that are conducive to population health activities. (Ramiah, et al. 2016). As a result, Medicaid providers and payers have focused most of their efforts on downstream quality of care initiatives aiming to directly improve the health of the most sick and expensive Medicaid beneficiaries.

Despite this, there is growing awareness that a greater focus on social determinants of health is warranted. As an example of the creativity and innovation that is now viewed as a key component to solving the pressing challenge of health care costs, the healthy housing movement, which focuses on the home environment as a social determinant of health, is discussed below.

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[3] Defining PCMH: https://pcmh.ahrq.gov/page/defining-pcmh

[4] About CMMI: https://www.cms.gov/about-cms/agency-information/cmsleadership/office_cmmi.html

[5] Funded by the Robert Wood Johnson Foundation

"Healthy Housing": The Home as a Social Determinant of Health

There is a strong and growing body of evidence that makes the correlation between poor housing conditions and someone's health. In a report titled, *The Surgeon General's Call to Action to Promote Healthy Homes,* the following summation is made to exhibit the breadth of connections between someone's home dwelling and their health:

> The link between these housing features and illness and injury is clear and compelling. A home's structural and safety features can increase risk for injuries, elevate blood lead levels, and exacerbate other conditions. Poor indoor air quality contributes to cancers, cardiovascular disease, asthma, and other illnesses. Poor water quality can lead to gastrointestinal illness and a range of other conditions, including neurological effects and cancer. Some chemicals in and around the home can contribute to acute poisonings and other toxic effects. All of these issues are influenced both by the physical environment of the home and by the behavior of the people living in the home (Office of the Surgeon General (US), 2009).

The condition of someone's home dwelling is a key determinant of their health. Poor quality housing conditions are associated with a wide range of health conditions, including respiratory infections, asthma, lead poisoning, injuries, and mental health problems (Krieger and Higgins 2002). In turn, these health conditions contribute in a significant way to the high demand[6] for and cost of health care in the United States. For example, asthma is the primary diagnosis in approximately 10.5 million visits to physician offices and 1.8 million visits to an emergency department each year (U.S. Centers for Disease Control and Prevention 2012); (U.S. Centers for Disease Control and Prevention 2011). Asthma has an annual estimated cost of $56 billion annually in the United States (U.S. Centers for Disease Control and Prevention 2014). Over 800,000 patients are hospitalized each year because of a fall injury, most often with a broken hip or head injury; Medicare costs alone for fall injuries among seniors totaled over $31 billion in 2015 (Prevention 2016). All told, home injuries cause more than 30,000 deaths and 12 million non-fatal injuries annually in the United States, resulting in an estimated $222 billion in lifetime costs (Gielen, McDonald and Shields 2015).

Low income households that do not have health insurance or that depend on federally subsidized Medicare and/or Medicaid programs experience disproportionately poorer housing conditions than households that can afford private health insurance. Households with fewer financial resources are more likely to experience unhealthy and unsafe housing conditions and are less able to remedy them, contributing to disparities in health across socioeconomic groups (Robert Wood Johnson Foundation, Commision to Build a Healthier America 2008). Low income households are often caught in a cycle of poverty and poor health that result in less healthy and productive communities and a continued increase in health care demand and costs.

Addressing the home as a social determinant of health can allow health program administrators to:

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[6] Demand is synonymous with the commonly used health care term: utilizations (as in, emergency department utilizations, hospital utilizations, etc.).

- Leverage Existing Knowledge: A strong and growing body of research makes the connection between poor housing conditions and morbidity or injury, as well as the economic burden on health care.
- Share Costs: Energy efficiency has a well-established, functioning and capable program implementation infrastructure that is already outfitted, partially funded by others, and can be leveraged by the health care industry.
- Move quickly: By combining the experienced field staff in energy efficiency with the dynamic program development within healthy housing, the broader healthcare industry can quickly begin to take the next steps toward controlling demand and costs through addressing the home as a social determinant of health.

Health measures conducive for integration into a co-funded energy efficiency programs include measures that reduce some of the most costly health care utilizations including trip and falls (seniors) and asthma. Health interventions may include measures such as installing handrails, improving lighting location and quality, and installing stair treads to reduce trips and falls for seniors, or removing carpet or mold, conducting integrated pest management services, and/or providing a deep housing cleanse to remove asthma triggers. Additional research is needed to assess health savings attributions for individuals health intervention measures.

Benefits of a Healthy Housing Population Health Management Program to Energy Efficiency Program Administrators and Rate Payers

It is difficult to find an example of a co-funded program in which a utility and a health care institution are working together to share the costs to develop and implement a comprehensive health, safety and energy efficiency program. There are several examples of energy efficiency programs integrating health intervention measures in which the primary funders are typically the local, state, and federal agencies or philanthropy. Examples include the following:

- The Maryland Department of Housing and Community Development's Enhanced Weatherization Program[7]
- Connecticut Efficient Healthy Homes Initiative[8]
- One Touch Vermont[9]

These programs provide key insights and learned lessons about how a co-funded health and energy efficiency co-funded program could potentially be developed in the future.

As summarized in the sections above, there is a strong opportunity for EE Programs to work with health care organizations to deliver low-income housing intervention measures that are mutually beneficial. EE programs integrated with health-focused housing intervention measures offer EE program administrators (PAs) a potential option to co-fund and enrich their low-income residential program offering. A co-funded model may also provide direct benefits to PAs by:

- Reducing EE program implementation costs and thus bill impacts.

[7] http://dhcd.maryland.gov/Residents/Pages/Enhanced-Weatherization-Program.aspx
[8] http://www.ehhd.org/filestorage/103/147/HHI_Brochure_WEB_10_12_11.pdf
[9] http://onetouchhousing.com/locations/vermont/

- Increasing the cost-effectiveness and breadth of low-income EE program services and thus reinforcing a vital link to low-income customers.
- Adding a new, innovative benefit to existing programs in the form of health-benefitting measures, PAs can soften the transition away from lighting savings.
- Increasing demand for PA services in the residential sector, augmenting workforce skills and job security.
- Building social and political capital for PAs, utilities, and other energy efficiency industry members.

One can also make the case that the synergistic energy and health benefits of low-income weatherization can also have rate payer benefits. For example, healthier workers will miss fewer days of work, resulting in household income gains. Some of these gains will be used to pay utility bills, which will reduce arrearages and disconnections.

Each of these points is elaborated upon in greater detail below.

Reduce or Stabilize Rate Impacts

Low-income whole house programs are some of the most important offerings in any PAs' energy efficiency portfolio. They are often fragile, in that a loss of savings or an increase in costs may pose a challenge to future viability. In the case of low-income customers, the ability to add to the services offered, while potentially decreasing the cost to the program administrators, is a central benefit of the proposed co-funding opportunity. One implementation of this model could emphasize combined residential energy and health-focused intervention measures, i.e. existing measures with both energy and non-energy impacts. For example, when a PA provides air sealing, it reduces air infiltration and therefore energy consumption for cooling and heating. The value of this energy reduction has traditionally been the primary benefit of efficiency measures. Yet air sealing can also reduce pest infestation, improve occupant comfort, and improve indoor air quality. There is a potential for other entities to capture the economic benefits of these Non-Energy Impacts (NEIs), primarily in the health care sector. This provides an opportunity for these entities to share the cost of the measure. For the PA, this could reduce the measure cost with no loss of energy savings. In addition, energy savings can cease to be the only driving factor to support health-focused housing intervention measures. For example, window replacements typically do not save enough energy to offset their relatively high cost; they usually are not included in energy efficiency programs that are required to meet cost-effectiveness standards. However, the health benefits associated with new windows—particularly related to reducing lead paint hazards--may justify a primary investment by the health sector, with energy savings realized by the utility sector. Funding from health care could also contribute to covering general program costs such as the cost of conducting a home audit and related administrative costs.

Maintain Customer Contact and Energy Efficiency Program Leadership

Maintaining a positive connection with customers is a key priority for utilities. Over the past 30 years, energy efficiency has often been the "face" by which customers get to know their utility. As J.D. Power and Associates points out in their 2011 Gas Utility Business Customer Survey, "Utilities that provide EE see a ten point increase in approval rating with their customers." In addition, customers include the desire for their utility to be a "good corporate

citizen" as one of the six key considerations in their ratings, and under that umbrella is energy efficiency. J.D. Power also notes that "satisfied customers who trust their provider may be more likely to seek advice about energy efficiency, and may be more receptive to important messages regarding safety and other topics" (State & Local Energy Efficiency Action Network 2011)

A partnership between a trusted health care system brand and a utility has the potential to increase satisfaction and trust by creating a robust program offering that improves comfort and health while reducing energy costs. In short, PAs always seek additional ways to maintain relationships with their customers and achieve cost-effective savings. We posit that adding health-focused measures and health system co-funding may contribute towards maintaining or even improving the established relationships between PAs and their customers in the coming years.

Contribute to a Stable Transition away from a Lighting-centric Program Model

As all residential programs begin to experience the dissipation of electric savings from lighting measures, the model of residential retrofit programs is being reassessed. Already, perhaps sooner than anticipated, PAs are seeing the attribution of lighting savings begin their inexorable decline. This will play out in a number of ways, but a key consideration is whether PAs can maintain the robust EE program delivery infrastructure (e.g., implementers, auditors, contractors, laborers, etc.) that has been so critical to achieving the dramatic successes to date.

To highlight this point, in many leading residential retrofit programs the conversion rate of the original site visit—which may include directly installing light bulbs, basic air sealing, and other simple measures—into deeper measures (such as insulation or efficient central heating and cooling systems) is about 35 percent" (National Grid 2013). If a significant portion of customer and program value derives from the site visit's direct install lighting measures then the loss of these savings and their contribution to cost-effectiveness may place a portion of the current audits in jeopardy. The lack of available electric savings may also hamper electric utilities from addressing the percentage of homes that heat with oil, propane, and other non-natural gas fuels.

In this context, the opportunity to bring new, health-benefitting measures and/or benefit streams to existing programs has the potential to buffer against the decline in lighting at a critical time in the energy efficiency industry. In addition, co-funding of administrative costs may reduce the 'fixed' site visit and general administration costs that must be offset by the value of energy savings. This should allow energy efficiency measures to continue to be deployed when they otherwise would not prove cost-effective in the absence of substantial lighting savings.

Maintain Energy Efficiency Program Workforce

While maintaining a robust program workforce is not in and of itself a concern for PAs, their goals do typically include program sustainability and stability. Doing so will require the continued participation of the auditor and contractor workforce. Home energy auditors make their decision to participate as a program contractor based on the value proposition. We feel that the loss of compensation for direct install lighting measures may hurt this value proposition, create a headwind for residential program implementers' marketing efforts, and could result in decreased contactor interest and participation.

Embracing health measures that could be incorporated into low-income energy efficiency programs to maintain the current program delivery model may create an incentive that helps reduce or eliminate this concern. Though research is needed to address auditor and contractor

management issues associated with integrating health measures, maintaining the energy efficiency contractor workforce undoubtedly provides the economic benefits of well-paid, non-exportable jobs. Both job creation and economic development are mentioned explicitly in many state and municipal priorities. If successful, co-funded EE and health programs can help PAs meet a core desire of these states: the creation and retention of jobs.

Build Social and Political Capital

Finally, collaboration between EE program administrators and health care providers and payers has the potential to create positive corporate, social, political, and regulatory outcomes. Hard to reach and vulnerable populations have long been a focus of PA programs and outreach. PAs' websites present many news items about how they work with and for low-income and hard to reach customers. Many of these make direct reference to corporate responsibility and social justice, or display photos of PA employees dedicating their time to projects serving the community. Pursuing innovative new partnerships with the healthcare industry demonstrates energy efficiency industry members' leadership and can help keep energy efficiency at the cutting edge of hard-nosed economic policies with wide-ranging social benefits.

"Who Holds the Keys?" The Role of Program Administrators

A co-funded model has the potential to deliver many benefits to PAs. It supports fulfilling corporate obligations, may well contribute to maintaining affordable access to EE benefits, developing new sources for savings, reducing rate and bill impacts, contributing towards meeting economic and job creation goals, providing a platform for additional product sales, supporting low-income populations, boosting corporate community involvement goals, and helping health care systems--who are some of the PAs' largest customers with their own institutional goals. It makes sense to further investigate how energy efficiency and health-focused housing intervention measures may provide a whole that is greater than the sum of its parts.

Delivering high-quality cost-effective energy efficiency services is not possible without PAs. Their guidance, support, and funding provide the energy efficiency framework and implementation infrastructure for customer outreach, solicitation, and participation. As the process for exploring outside funds continues, whether through health care or other sources, it will be critical to have PAs in partnership and collaboration. PAs will need to lend their support as key stakeholders alongside healthy housing experts and health care system(s) representatives. There is little time to spare if this idea is to gain traction and help reign in health care demand and costs, and bring to fruition the many potential benefits of collaboration between the energy efficiency and health care industries.

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