Demand-Side Management Policy: Implementation and Success

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Abstract

The policy side of demand-side management (DSM) has been under-researched in the academic literature with the majority of studies focussing on technological trials, utility programmes and modelling analyses on the technical potential of DSM. The research contributes to filling this knowledge gap by concentrating on the evaluation of DSM policies that have been implemented around the world since the energy crises of the 1970s. The meta-evaluation aims to determine the mechanisms behind the success, failure and transferability of DSM policies by undertaking a global systematic review (realist synthesis) of policies implemented in all sectors (residential, commercial and industrial, but excluding transport and agriculture). The paper focuses on one part of the research project – the global implementation and success of DSM policies.

Broad categories of DSM policy include those that are market-based (e.g. demand response tariffs or market transformations), regulatory (e.g. utility obligations or performance standards), financial (e.g. grants or tax incentives), information-based (e.g. educational or training programmes), and voluntary (e.g. voluntary industrial agreements). The systematic review synthesises 119 high-quality documents (covering 690 evaluations) that have evaluated specific DSM policies, which were obtained from 35 academic, industrial and governmental databases. The results show that 35 countries and 61 states (including provinces and regions) across six continents have implemented DSM policies with at least one high-quality evaluation. 22 success factors were identified and were analysed using a proposed method for examining policy success involving frequency and weighting. The most frequently discussed factors across evaluations were: regulatory frameworks, comprehensive evaluation, industry engagement, and legislative support. However, the most highly weighted factors were: regulatory frameworks, political support, clear timeframes, stable budgets, and clear definition of roles. Overall, regulatory frameworks was considered to be the most important factor across all DSM policies. The key success factors for each DSM policy category are given.

Introduction

Policy Objectives

The main focus of energy policy varies spatially and temporally around the world. In North America, energy security was a prominent objective in the energy crises of the 1970s (in 1973 and 1979 – see Hamilton, 2011), but the recent discovery of shale gas and oil has helped to shift energy policy towards carbon emissions reduction. In more recent decades in Europe, energy policy has been dominated by carbon emissions objectives, though the current emphasis has moved to include affordability for consumers. In east-Asia, particularly China, there has been a strong focus on local air pollution reduction and mitigating health concerns due to the building of coal power plants close to densely populated areas. In Africa, energy access (alongside energy security) has been a priority for energy policy. Nevertheless, the global trend reveals that governments are increasingly trying to balance competing policy objectives for energy security, affordability and carbon emissions reduction. This has been fuelled by climate change issues, resource depletion and consequent price increases, the growth of electronics in society, and energy demand growth, particularly in emerging economies such as China and India.

Solutions to this complex issue include building interconnections between countries, increasing the construction of low carbon power plants (such as renewables), developing and

building the required energy infrastructure for a smart(er) grid, energy storage (such as compressed air energy storage), and demand-side management (DSM). These solutions are complementary in nature, though the paper focuses on DSM.

Demand-Side Management (DSM)

DSM refers to "technologies, actions and programmes on the demand-side of energy meters that seek to manage or decrease energy consumption, in order to reduce total energy system expenditures or contribute to the achievement of policy objectives such as emissions reduction or balancing supply and demand" (Warren, 2014a). DSM includes energy efficiency (such as insulation or efficient lighting), demand response (such as time-of-use pricing or incentive payments for peak load reduction), and on-site back-up generation and storage (such as micro-generation or hot water storage tanks). Although demand response has been implemented in some industries in various countries for a number of decades (such as the USA and UK), it has had limited attention in the commercial and residential sectors. Here the experiences have revolved around small-scale trials and programmes undertaken by utilities or system operators independent of government policies.

The research discussed in this paper categorises DSM into 'Policy Type', 'Policy Category', and 'Specific Policy', with each level becoming more detailed. Only the first two levels are given in full below, as analysis takes place at the 'Policy Category' level. However, some examples at the 'Specific Policy' level are given in brackets:

Market-based:

- Incentive payment-based demand response (e.g. interruptible/curtailment programmes)
- Price-based demand response (e.g. time-of-use pricing, critical peak pricing tariffs)
- Market transformations (e.g. removal of market barriers, market stimulation programmes)

Regulatory:

- Infrastructure rollouts (e.g. smart meter rollouts, energy display monitor rollouts)
- Utility obligations (e.g. energy efficiency resource standards, white certificate schemes)
- Labelling (e.g. appliance energy efficiency labelling, building labelling)
- Performance standards (e.g. equipment energy efficiency standards, building codes)

Fiscal:

- Loans and subsidies (e.g. tax incentives, grants)
- Utility business models (e.g. decoupling policies, integrated resource planning)
- Research and development programmes (e.g. funding for deployment programmes)

Information-based:

- Information campaigns (e.g. energy audits, training programmes)

Voluntary:

- Voluntary programmes (e.g. industrial voluntary agreements, large commercial agreements)

Research Focus

There is a vast literature on DSM dating back to the 1970s, though the focus has primarily been on technological trials, utility programmes and modelling studies on the technical potential of DSM. DSM policy evaluation has received much less attention and is often limited to assessments of expected impacts rather than post-policy evaluations. This paper presents some of the results from a three-year study that aimed to collate and synthesise all of the high-quality DSM (post-) policy evaluations that have been conducted around the world. The primary aims of the research are to

examine DSM policy implementation, determine the key factors behind policy success and failure, and explore the transferability of successful DSM policies between countries. This paper focuses on the first two aims – the global implementation and success of DSM policies. The spatial trends in implementation are discussed, followed by an exploration of the key factors that determine the success of specific DSM policies. The next section details the research methodology.

Methodology

Methodological Approach

This paper presents the results of a three-year study to determine the mechanisms behind how and why DSM policies succeed or fail, and to explore the transferability of successful DSM policies between countries. The *Research process onion* concept (Saunders *et al*., 2007) for research design is employed, and the research fits into the pragmatism research philosophy, which focuses on the method and using methods that are well suited to meeting the research aims.

Systematic Review

Systematic Reviews are a method widely used in the medical sciences, particularly through the Cochrane Collaboration (providing a database of >5,000 systematic reviews), but it has had limited attention in other disciplines. However, the Campbell Collaboration, established in 2000, is beginning to apply the method to other policy areas, such as education, crime and justice, and social welfare. Nevertheless, it has had limited application in the energy policy field and there have been calls for this to be undertaken (Sorrell, 2007; Watson *et al*., 2011). Systematic reviews involve collating all the studies that have been done on a particular intervention and aggregating or synthesising the data in order to better understand the outcomes of the intervention. Documents that may be included in a systematic review are: published and unpublished material, academic and 'gray' literature (such as policy documents and industrial reports), peer reviewed and non-peer reviewed documents, and English and non-English publications. However, a key part of the method, unlike traditional reviews (such as literature reviews or scoping reviews), is the detailing of a search strategy, inclusion criteria, and the critical appraisal of the methodological quality of the documents reviewed (Petticrew and Roberts, 2006).

Details on how the systematic review was utilised in this research are discussed in Warren (2014b) and are not reproduced here in depth. However, in summary, the realist synthesis type of systematic review was employed, as it is appropriate for understanding how and why interventions work (or do not) by exploring their underlying mechanisms (Pawson, 2002a, Pawson, 2002b). Other types of systematic review, such as meta-analyses, are inappropriate for this research, as they would only provide statistically aggregated impacts of policies that are implemented in quite different contexts (e.g. different market structures and climates), thus questioning the usefulness of the results for looking at policy transferability between countries and states. Systematic reviews involve four filtering stages: firstly the number of initial hits from inputting a relevant search term into a database is recorded; secondly the titles of the hits are scanned for relevant documents; thirdly the abstracts are read to further reduce the sample size; fourthly the full document is read and the proposed study quality assessment scale (the *Warren Scale*, shown below) is applied to assess the study quality of the remaining evaluations. Those that achieve half or more of the total number of points (7 or more out of 14) pass the final filtering stage and are included in the sample.

The systematic review included 119 high-quality DSM policy evaluation documents from 35 databases (eleven academic, ten industrial, thirteen policy databases, and one interviews database covering quantitative interviews with seventeen DSM experts). The initial number of total hits aggregated across all of the databases was 15,894 documents. Due to the nature of systematic

reviews to capture all relevant evidence of a high quality, the total number of documents is not pre-determined and instead the sample size is determined by the amount of existing evidence. It is important to note that the 119 documents did not equal 119 policy evaluations, as the majority of the documents included comparative analyses of different countries and policies. Thus, the final number of evaluations (which varied in their depth of analysis) totalled 690.

Table 1. *Warren Scale*: assessing study quality in energy policy evaluations (Warren, 2014b)

4 points (Implementation)	Who implemented the policy?
	How was the policy designed?
	How was the policy implemented?
	Why was the policy implemented?
4 points (Evaluation)	Who evaluated the policy?
	How was the policy evaluated?
	What were the impacts of the policy?
	How successful was the policy?
2 points (Peer Review)	Was the evaluation peer reviewed by a relevant expert?
	Was the evaluation peer reviewed by 2+ relevant experts?
2 points (Acknowledgements)	Are there statements of conflicts of interest and/or copyright?
	Are there statements of acknowledgement?
1 point (Reliability)	Is the author/institution reliable?
1 point (Context)	Are the totals given when percentages are used?

Approach for Data Analysis

The definition for determining whether or not a DSM policy (or package of policies) was successful varies, and this was evident from the documents. Some evaluations put emphasis on performance criteria, focussing on quantitative impacts such as carbon dioxide equivalent savings (CO_{2e}), financial savings or costs (£), energy savings (MW or MWh), numbers of installations or contracts signed, or on the number of relevant policies implemented by a government. Other evaluations focused on whether or not the outcomes met the original policy objectives, some concentrated on cost-effectiveness, and others looked at the degree of unintended consequences of a policy or how one policy affected another policy. The systematic review indirectly encompasses all of the definitions as it does not define its own criteria for success but instead determines this through whether or not the evaluation documents deem the policy (or policies) to have been successful. The justification for this approach is based on the specific research focus, which is to determine the key factors that contribute to the success of a policy, rather than simply stating that it has been successful or unsuccessful based on its impacts. Evaluations that look only at quantitative impacts (such as energy savings or programme costs) cannot qualitatively say how and why the policy worked, which is crucial for the design and implementation of future DSM policies, or assessing the transferability of successful policies between countries and states. However, all types of DSM policy evaluation were included in the systematic review with most evaluations focussing on performance criteria.

The key success factors are determined inductively from the evaluation documents and are not pre-defined. Twelve individual DSM policies and a further nine policy packages were included in the analysis, as listed below (with acronyms and explanations). The policy packages were determined from the systematic review based on those packages with one or more evaluations.

- **IPBDR** (Incentive payment-based demand response)
- **PBDR** (Price-based demand response)
- **MT** (Market transformations)

- **IR** (Infrastructure rollouts)
- **UO** (Utility obligations)
- **LB** (Labelling)
- **PS** (Performance standards)
- **L&S** (Loans and subsidies)
- **UBM** (Utility business models)
- **R&D** (Research and development programmes)
- **IC** (Information campaigns)
- **VP** (Voluntary programmes)
- **IPBDR/PBDR** (policy package of IPBDR and PBDR)
- **UBM/MT** (policy package of UBM and MT)
- **IC/L&S** (policy package of IC and L&S)
- **PS/IC** (policy package of PS and IC)
- **PS/LB/IC** (policy package of PS, LB and IC)
- **PS/LB** (policy package of PS and LB)
- **IC/L&S/MT** (policy package of IC, L&S and MT)
- **PS/LB/UO/L&S** (policy package of PS, LB, UO and L&S)
- **VP/L&S** (policy package of VP and L&S)

The realist synthesis type of systematic review, as pioneered by Pawson (2002a, 2002b) in other disciplines, has been criticised for not specifically stating how it should be conducted in practice. The research aims to fill this gap by proposing a method for quantifying qualitative data in order to determine policy success. The data analysis is based on synthesising the frequency with which various success factors are discussed and weighting them based on the emphasis evaluations give to them. Both aspects are important in the understanding of policy mechanisms, but by themselves are less reliable as indicators. The more frequent a success factor is mentioned across evaluations, the more likely it is to be an important factor. However, frequency does not give the degree of importance of the factor. Determining the weighting of factors based on the emphasis within each evaluation overcomes this drawback. Nevertheless, without frequency, weightings do not give an indication of whether or not the emphasis is similar for a given policy across evaluations.

The discussion of results is split into two parts. The first part involves the spatial analysis of global implementation patterns, and the second part involves the analysis of the frequency and weightings of success factors (in general and by DSM policy).

Results

Evidence Base

The evidence base for DSM policy is reasonably limited with a large number of governments, institutions and researchers not evaluating previously implemented policies. It is also important to note that the findings are based on high-quality evaluations, and there were a large number of evaluations in the third and fourth filtering stages of the systematic review that are potentially relevant but of a lower quality and thus were not included. As such, these evaluations may indicate a bigger evidence base than that suggested in this research. Despite this, a scoping review undertaken prior to the systematic review indicates that the focus of studies has primarily been on technological trials, utility programmes and modelling studies on the technical potential of DSM, rather than DSM policy. The scoping review is discussed in Warren (2014a).

From the 119 documents, there were 690 evaluations. The frequency of discussion by DSM policy (excluding policy packages) is:

1. Utility business models (122 evaluations)
2. Information campaigns (118 evaluations)
3. Loans and subsidies (100 evaluations)
4. Utility obligations (89 evaluations)
5. Performance standards (81 evaluations)
6. Incentive payment-based demand response (62 evaluations)
7. Labelling (42 evaluations)
8. Price-based demand response (26 evaluations)
9. Market transformations (17 evaluations)
10. Research and development programmes (17 evaluations)
11. Voluntary programmes (12 evaluations)
12. Infrastructure rollouts (4 evaluations)

As the findings show, utility business models, information campaigns, and loans and subsidies are the most frequently implemented DSM policy (where high-quality evaluations are conducted). In contrast, voluntary programmes and infrastructure rollouts are the least implemented and evaluated policies. It is likely that the number of evaluations for infrastructure rollouts will increase after 2020 due to the influence of European Union (EU) directives in Europe. A large number of European countries are currently introducing nation-wide rollouts of smart meters to residential (and some small commercial) consumers. This is in response to the EU's *Smart Meter Rollout Directive* (2009/72/EC), which requires member states to reach at least 80% rollout by 2020.

Another interesting observation is the much higher number of evaluations for IPBDR (62) than PBDR (26). This may reflect the preference of system operators to introduce agreements with large consumers to reduce consumption during peak times rather than introduce a more complex set of time-varying prices for all types of consumers. A second reason is that the two categories of demand response tend to be implemented together as a package, as figure one below shows. The figure summarises the number of evaluations that discuss each of the nine policy packages included in the systematic review. It highlights that the IPBDR/PBDR policy mix is in the top three most frequently discussed policy packages (7 evaluations), after IC/L&S (13 evaluations) and PS/LB (10 evaluations). Much of the larger scale experience with demand response comes from the USA at a regional level through system operators, such as PJM, ISO-NE and NYISO. However, some Chinese provinces have recently begun large-scale demand response testing (notably Jiangsu and Beijing).

The size of the bubbles in figure 1 simply reiterate the number of evaluations per policy package (the larger the bubble, the greater the number of evaluations). The IC/L&S policy package is popular due to the complementary nature of the policies. If a government offers loans or grants to consumers for energy efficiency measures or on-site generation (for example), the policy is more likely to be successful if clearly marketed. Countries that have implemented and evaluated this package include: China, Germany, Mexico, New Zealand, Sri Lanka, the USA, and some US states (Illinois, Massachusetts, Maine, Ohio, New Hampshire, and Wisconsin).

The PS/LB policy package is similarly popular due to the complementary nature of the policies. Introducing minimum energy efficiency standards for equipment, buildings or appliances are likely to be more successful in terms of manufacturing compliance and consumer education if they are clearly labelled (for example, with energy efficiency information, cost savings, etc.). The same argument applies to the PS/IC policy package where manufacturing compliance and consumer education should improve if performance standards are well-marketed. Countries that have implemented this package include: China, the EU, Pakistan, and some Chinese provinces (Shanghai, Beijing, Guangzhou, Hefei, Shandong, Sichuan, and Jiangsu).

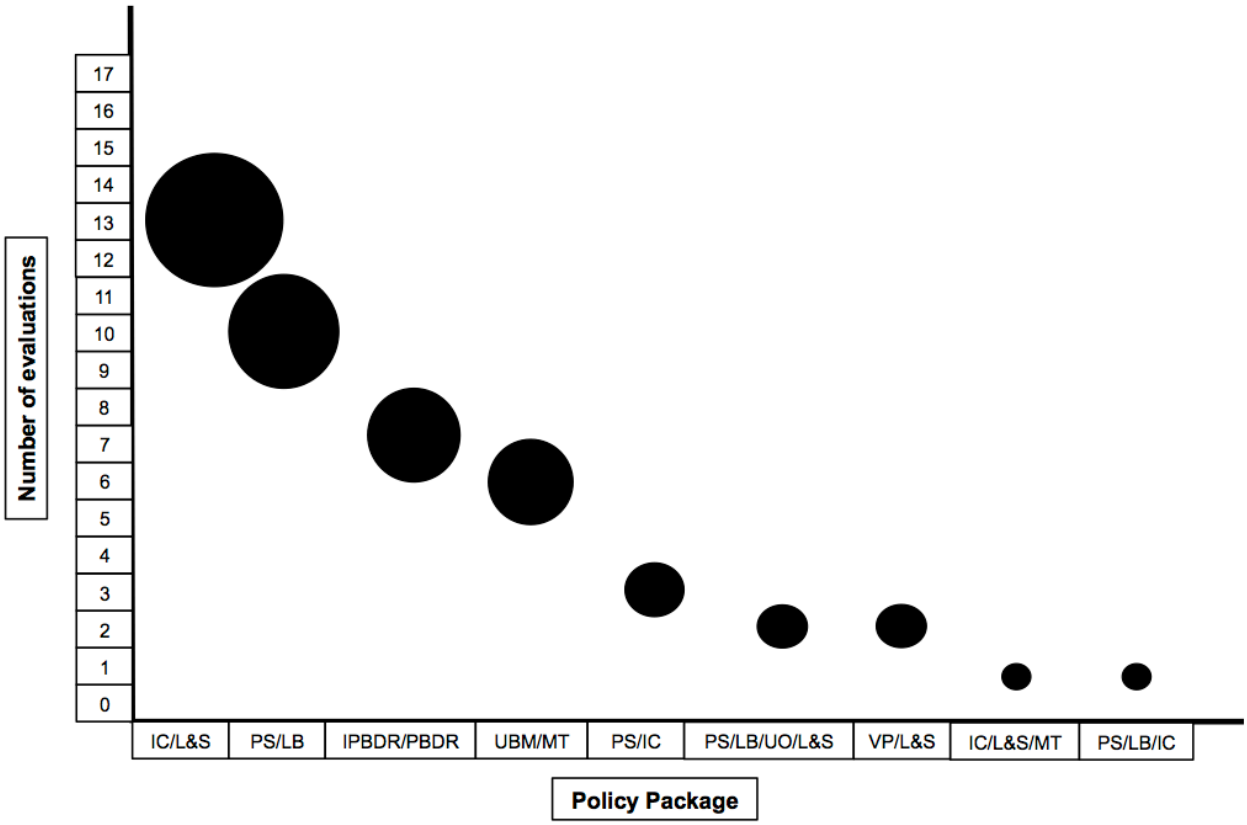

Figure 1: Number of evaluations by DSM policy package

Utility business models (UBM) are the most frequently evaluated DSM policy category due to two main reasons. Firstly, the DSM policy evidence base is strongest in the USA at a state-level, where the policy has been widely implemented. Secondly, the term refers to a wide range of specific DSM policies, such as decoupling (8 evaluations), shareholder incentives (shared benefits, performance targets, rates of return) (62 evaluations), revenue regulation (0 evaluations), revenue-cost recovery mechanisms (3 evaluations), direct incentives (0 evaluations), and system benefits charges (also known as public goods charges) (49 evaluations). The theory behind utility business models is discussed further in Hayes *et al*. (2011) and not reproduced here. The inclusion of system benefits charges in this category greatly increases the number of evaluations outside of the USA that can be considered to have had experience with this policy category. However, if the spatial diversity of implementation of various DSM policies is considered in terms of the number of countries that have implemented a given policy, loans and subsidies (24 countries), information campaigns (20 countries), and utility obligations (20 countries) perform the best, with UBM moving down six places. Nevertheless, with implementation in 14 countries, UBM still performs well due to the inclusion of system benefits charges, as shown in figure 2.

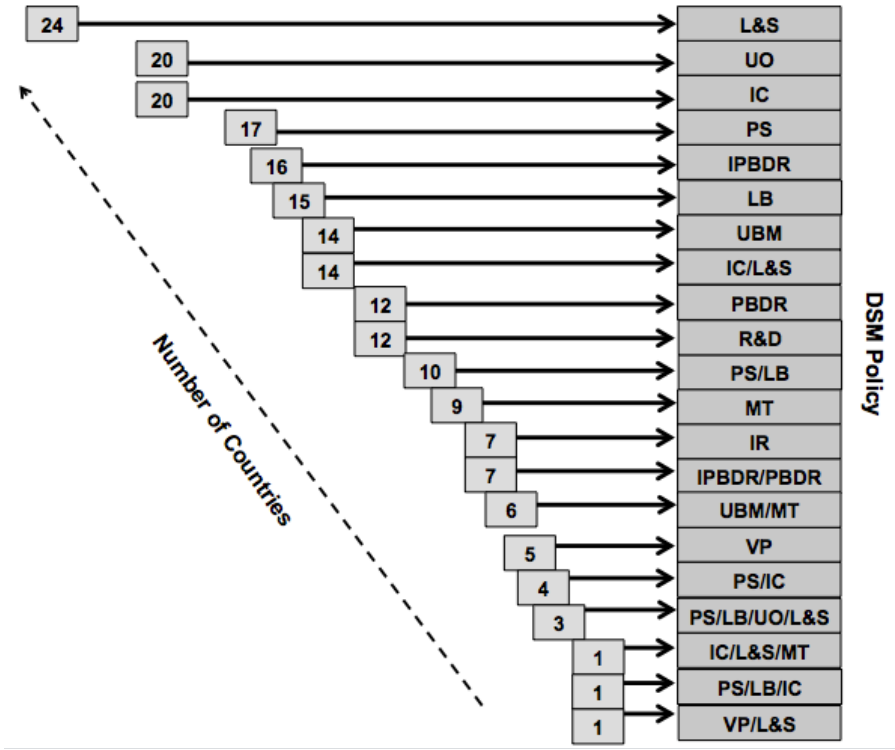

Figure 2: Number of countries that have implemented each category of DSM policy

Spatial Patterns

The evidence base is led by North America and Europe with the USA and the UK being the most prominent countries in implementing and evaluating DSM policies. The research included 35 countries and 61 states (including provinces, regions and states) across six continents. Figure 3 summarises the total number of documents per country where it is the primary country of interest (for documents analysing more than one country). However, the overall total does not equal 119 as some documents undertake comparative analysis of different countries without emphasising one particular country. This was particularly the case with evaluations comparing utility obligations in different countries, most notably the UK, France and Italy. In these cases, three evaluations would be included for the one document. From figure 3, France, China, Denmark and Italy also appear to have strong evidence bases.

Figure 3 only includes policies implemented and evaluated by national governments. At a state-level, the USA still leads, though an interesting observation is that the number of documents far exceeds that at a national level, suggesting that US state governments have been more proactive than the federal government (103 evaluations in comparison to 25 evaluations respectively). California (USA) dominates the evidence base at a state-level (with 20 documents), and although this is well known in the literature, this research has synthesised high-quality evidence to show that this is the case. California is followed by New York (USA) (9 documents) and New South Wales (Australia) (6 documents). All other states, regions and provinces have 1-4 documents. When global comparisons are made at a state-level, the evidence can be broken down as follows:

- US states: 103 documents
- Chinese provinces: 18 documents
- Australian states: 13 documents
- Canadian provinces: 3 documents
- Belgian regions: 2 documents
- Indian states: 1 document

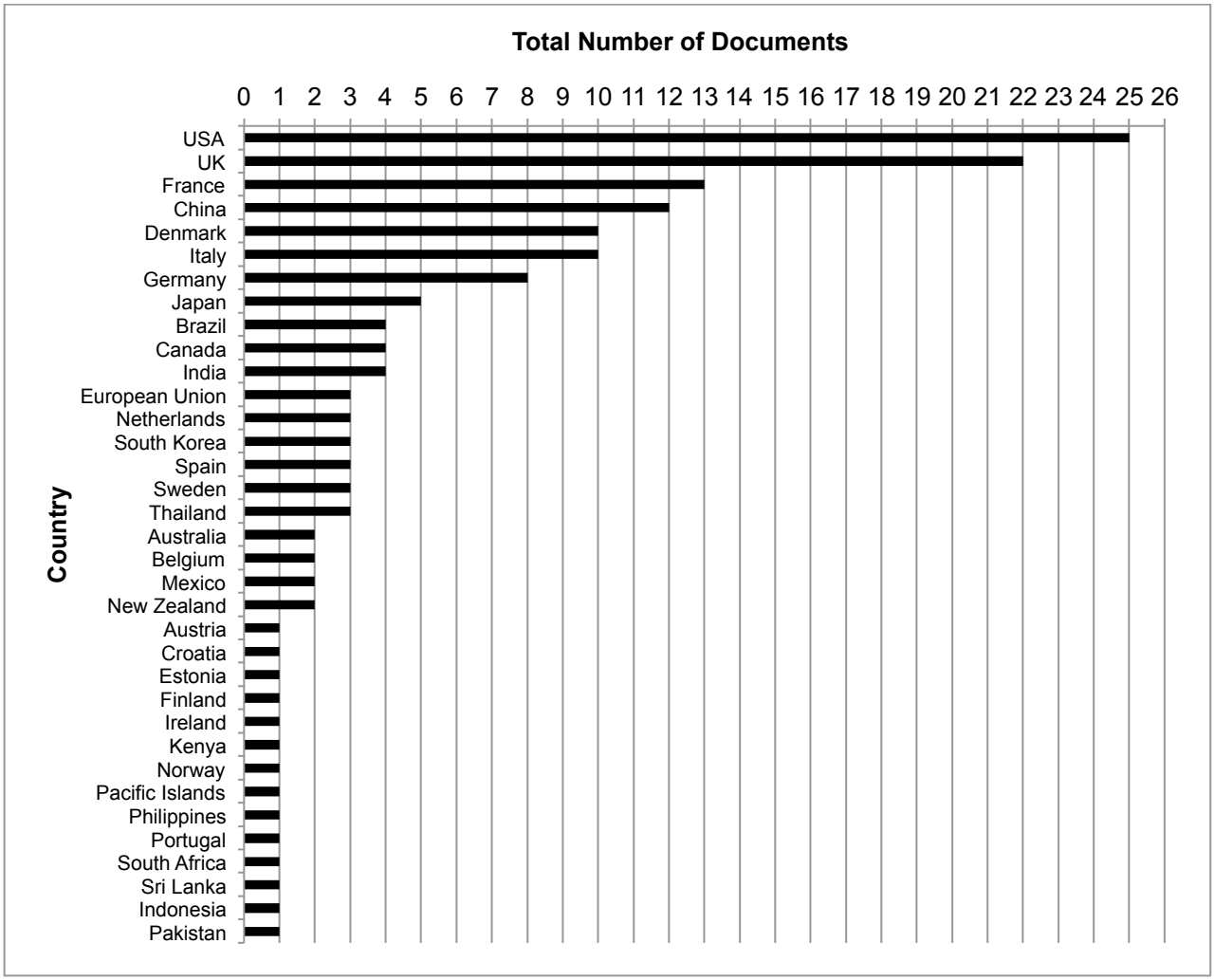

Figure 3: Evidence base of high-quality DSM policy evaluations by country

As the full analysis does not separate national and state governments, table 2 combines the results to list the most frequently discussed countries and states (based on those with ≥10 documents).

Table 2: Evidence base of high-quality evaluations by national and state governments

Country or State	Total (Number of Documents)
USA	25
UK	22
California (USA)	20
France	13
China	12
Denmark	10
Italy	10

Key Success Factors

The results were first aggregated across all DSM policies to determine the key factors for success. By frequency, regulatory support, particularly in the form of regulatory frameworks (which set out the rules, direction, objectives, platforms for market development, etc.), is the most important

factor and was present in 79% of all documents consulted (94 documents). Comprehensive evaluation (from design through implementation to post-policy evaluation), industry engagement, and legislative support (which legislates requirements, puts in place procedures for enforcement and penalties, etc.) also rank highly (66, 54 and 53 documents respectively). At the other end of the ranking, wide coverage (in terms of sectors and numbers of consumers or utilities covered), clear policy timeframes, and return on investments were only mentioned in a few evaluations as crucial factors. Figure 4 summarises the results, which categorises factors by colour into groups: regulatory support, financial support, policy characteristics, stakeholder engagement, and infrastructure.

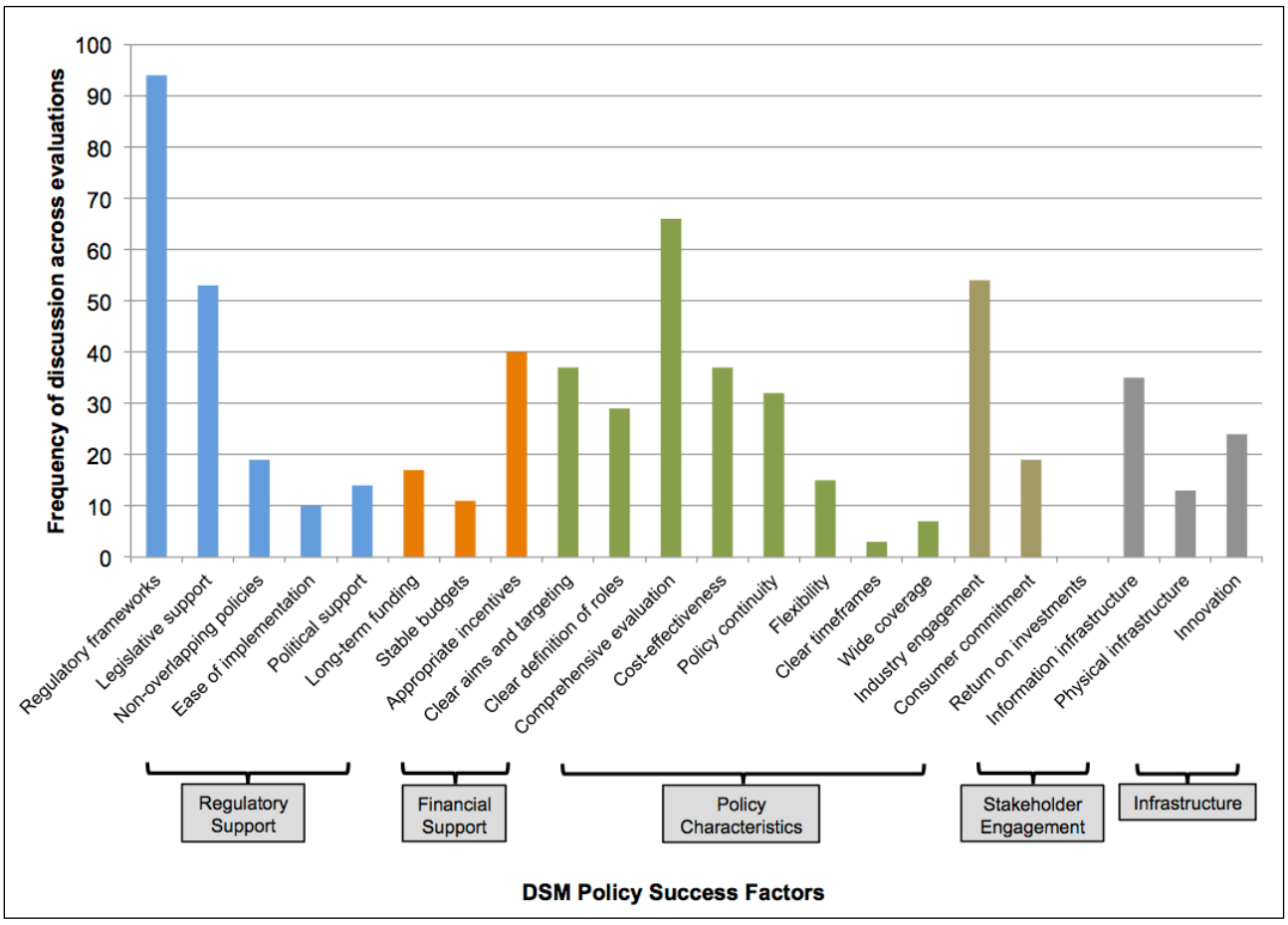

Figure 4: Frequency of DSM policy success factors across evaluations

By weighting, regulatory frameworks (2.6 weighting), political support (2.5 weighting), clear timeframes (2.5 weighting), stable budgets (2.5 weighting), and clear definition of roles (2.5 weighting) are the most important factors. In order to turn qualitative statements of factor emphasis into quantitative weightings, the following proposed technique and scale were used:

Score weighting 1: factor is included towards the middle or end of a list of other factors without emphasis, or it is indirectly inferred as a factor

Score weighting 2: factor is included at the start of a list and discussed though not strongly emphasised, or it is referred to using phrases such as: 'quite important', 'played a role', or equivalent

Score weighting 3: the following words are used to strongly emphasis importance: 'critical', 'crucial', 'important', 'necessary', 'primary reason(s)', 'key', 'vital', 'central', or equivalent

Averages across DSM policies were calculated in order to produce an overall weighting for each factor. Averages increased the scale to one decimal place (thus the factor weightings were ranked based on a scale from 1.0 to 3.0). At the other end of the scale, return on investments (1.1 weighting), ease of implementation (1.2 weighting), and innovation (1.3 weighting) had the lowest weightings. In combining the results for frequency and weighting, it is clear that regulatory frameworks is the most important success factor overall.

Key Success Factors by DSM Policy

The second part of the analysis used the same method to determine the key factors by DSM policy. As the research is still in progress, only the results by frequency are currently available and are discussed here. The top factors for each policy by frequency of discussion are listed below:

- *Utility obligations:* regulatory frameworks, comprehensive evaluation, legislative support
- *Performance standards:* regulatory frameworks, legislative support, information infrastructure
- *IBPDR:* regulatory frameworks, information infrastructure, appropriate incentives
- *PBDR:* regulatory frameworks, information infrastructure, appropriate incentives
- *Utility business models:* regulatory frameworks, legislative support, appropriate incentives
- *Loans and subsidies:* regulatory frameworks, information infrastructure, legislative support
- *Information campaign:* regulatory frameworks, information infrastructure, appropriate incentives
- *Labelling:* regulatory frameworks, policy continuity, consumer commitment
- *Infrastructure rollouts:* information infrastructure, regulatory frameworks, physical infrastructure
- *Market transformations:* appropriate incentives, consumer commitment
- *R&D programme:* regulatory frameworks, legislative support, appropriate incentives, innovation
- *Voluntary programmes:* regulatory frameworks, appropriate incentives, flexibility

The results show that regulatory support, particularly in the form of regulatory frameworks and legislative support, is the most important factor grouping for success for the majority of DSM policies. The two factors are crucial in 92% of the policies (11 out of 12 policies). Appropriate incentives and information infrastructure also appear as key factors for 83% of the policies (10 out of 12 policies). Appropriate incentives refer to those that are financial or non-financial, but strongly incentivise the relevant parties to engage with DSM. Information infrastructure refers to the amount and appropriateness of information provided to relevant parties. The information should be tailored to the party in question and its aims are likely to vary based on whether it is for educational-purposes (e.g. to encourage consumers) or is explanatory in nature (e.g. outlining regulatory requirements).

Conclusion

Demand-side management (DSM) policy is an under-researched area with the focus having been on technological trials, utility programmes and studies modelling the technical potential of DSM. The primary aims of the presented research are to examine DSM policy implementation, determine the key factors behind policy success and failure, and explore the transferability of successful DSM policies between countries. This paper focussed on the first two aims – the global implementation and success of DSM policies. A systematic review is employed to synthesise high-quality DSM policy evaluation documents conducted around the world, and a method for examining the factors behind policy success is proposed, which uses the analysis of frequency and weighting.

The research synthesised 119 high-quality documents (covering 690 evaluations) from 35 academic, industrial and governmental databases. 35 countries and 61 states (including provinces and regions) across six continents were included, and 12 individual DSM policies and 9 policy packages were examined. By policy, utility business models, information campaigns, and loans and subsidies had the greatest number of evaluations, with infrastructure rollouts, voluntary programmes, and

research and development programmes having the lowest number of evaluations. By country and state, the USA, California (USA), the UK, France, China, Denmark, and Italy had the highest number of documents concentrating on them as the principle countries of evaluation.

22 success factors were identified, and the results showed that by frequency, regulatory frameworks is the most regularly discussed success factor both when DSM policies are combined, and individually for 92% of the policies (11 out of 12 policies). Comprehensive evaluation, industry engagement, and legislative support are also discussed frequently when DSM policies are combined, and appropriate incentives and information infrastructure are discussed regularly at an individual policy level for 83% of the policies (11 out of 12 policies). By weighting, the results showed that regulatory frameworks, political support, clear timeframes, stable budgets, and clear definition of roles are the most important factors when DSM policies are combined. Overall, regulatory frameworks is the most crucial factor when the analyses for frequency and weighting are integrated. Despite this, it is clear that all 22 factors discussed in the research are important in determining the success of DSM policies. What the research aimed to do was to identify the crucial factors for each policy from the 22 factors, which if absent, would increase the probability of policy failure compared with the other factors.

The research is currently in progress and further analysis will include the weighting of success factors by policy, the frequency and weighting of success factors by country, the analysis of failure factors by policy and country, the identification of successful DSM policies, and the examination of the transferability of successful DSM policies between countries and states.

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