

Impact of planned power outages (load shedding) on consumers in developing countries: Evidence from South Africa

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Abstract

Energy security and reliable supply are as important as transitioning to cleaner energy production systems. Emotions towards such energy policies and projects should be more constructively responded to by policymakers. We explore how the public's attribution of blame for an energy policy failure when reliable electricity disintegrates in the context of South Africa's load shedding, as well as the public's own volition to reduce energy demand, impacts emotions and resulting behaviour. Results indicate that consumers attribute blame, resulting in anger and frustration, as well as negative word-of-mouth and seeking social support. This study considers load shedding as an ongoing energy policy failure and offers insight into managing specific stakeholders during this time, including developing more effective communication and service recovery strategies that are more consumer-centric and addressing the behavioural problem of decreasing the demand but also managing consumers' emotions and behaviour

during such time until effective solutions are implemented. Policy implications include that the Government and the electricity provider should accept responsibility for the service failure, consider public consultations, and develop communication strategies to convey the effect of consumer involvement in energy-saving activities to prevent load shedding aimed at behavioural change benefitting the individual and society.

Keywords: energy policy failure, attribution-of-blame, anger, frustration, negative WOM, support-seeking

1. Introduction

Modern societies function because of a wide range of technologically mediated services, usually classified as essential services which include electricity, water, and sanitation services (Van der Merwe *et al.*, 2018). These are crucial to individual well-being and the functioning of contemporary society. Service failure of any kind in relation to these services, results in large economic and social consequences (Baik *et al.*, 2018). In developing countries, nearly a billion people have no or sporadic electricity access (Burgess *et al.*, 2020), resulting in research focusing on access to electricity (e.g., Bohlmann & Inglesi-Lotz, 2021). Still, the reliability of electricity supply has received little attention, yet power outages happen often (Meles, 2020). The lack of reliable electricity not only hinders economic progress in developing countries (World Bank, 2018) but also affects the individual consumer negatively. Access to reliable electricity is an essential service encapsulated in the Sustainable Development Goal 7 (SDG) 7 which refers to access to “affordable, reliable, sustainable, and modern energy for all”, by 2030 (World Bank, 2018). Focusing on the latter part of SDG 7, recent studies regarding energy

policy focus on sustainable energy policy to support transition in energy provision both globally (Gillham *et al.*, 2023; Sumarno *et al.*, 2022) and specifically in South Africa (Kruger & Eberhard, 2023; Schmid & Lumsden, 2023). Nevertheless, developing countries encounter specific challenges in implementing these policies, including financial constraints, institutional barriers, and technological limitations (Falcone, 2023). Given that it may take some time before sustainable energy policies come to full fruition in developing countries, it is important to address the current challenges these countries face such as unreliable electricity supply. Therefore, the policy implications of unreliable electricity supply in the form of scheduled national power outages in South Africa are the focus of this article.

Over the years, the electricity utility in many developing countries, such as South Africa, has been unable to match the electricity demand (Pegels, 2010; Meles, 2020). The key reasons behind the frequent scheduled as well as unscheduled power outages are often inadequate physical conditions and limited capacity of the transmission and distribution (Meles, 2020) as well as increased electricity usage over time in South Africa (Bohlmann and Inglesi-Lotz, 2021). Consequently, load shedding is the South African Government energy utility, Eskom's, policy implemented to 'reduce demand on the energy generation system by temporarily switching off the distribution of energy to certain geographical areas' (Western Cape Government, 2019). An unreliable energy supply (e.g., load shedding) increases the cost of managing these interruptions for consumers, impacting consumers' welfare negatively (Acharya & Adhikari, 2021). Load shedding is a form of service failure, specifically an energy policy failure, referred to as an 'energy policy which does not meet local, national, and international energy and climate goals across the activities of the energy life-cycle and where just outcomes are not delivered' (Sokolowski & Heffron, 2022). These planned systematic power outages occur regularly often without warning to the public (Van der Merwe *et al.*,

2018), is thus an ideal opportunity to investigate energy policy failure and shed light on the impact of unreliable energy supply on consumers' behaviour in a developing country context.

Goal obstruction that occurs with service failures often causes an emotional imbalance (Lazarus and Folkman, 1984). To restore internal equilibrium, individuals employ coping strategies such as attributing the blame for a service failure to an external source (Yen *et al.*, 2004). The process of attribution of blame, consequent emotions, and resulting behaviour to service failures could be different between countries given varying cultural orientations and stages of economic development (Hui *et al.*, 2011), especially in the context of energy policy failures. Customers experience discrete emotions based on their attribution of the responsibility for the service failure (Gelbrich, 2010). Consumers experiencing anger and/or frustration need to attribute blame and solve service failures to obtain their goals (Le and Ho, 2020). Specifically, if the service provider is to blame, consumers will likely feel angry, while if the service failure is due to situational variables or the environment, consumers often feel less frustrated (Le and Ho, 2020). Furthermore, to manage these negative emotions and diminish their emotional anguish, customers could engage in several behavioural responses (for example, negative word-of-mouth (WOM) or support-seeking) (Gelbrich, 2010; Sengupta *et al.*, 2015).

Emotions, such as anger and frustration, may play a fundamental part in how consumers react to public policies in general, and energy policies (e.g., load shedding), in particular (Huijts, 2022). Anger and frustration are important emotions to understand because the negative behaviours associated with these emotions shape consumer behaviour (Lubbe and De Meyer-Heydenrych, 2019). In addition, more research is required to comprehend how consumers interrelate with and feel about a service provider after a service failure, leading researchers to

refocus their research to investigate consumers' responses to service failures (Khamitov *et al.*, 2020). Negative sentiments such as frustration and anger have been widely researched in literature (Bonifield and Cole, 2007; Le and Ho, 2020; Su *et al.*, 2018), yet not in essential service failure contexts and mainly in developed countries.

To formulate effectual energy transition policies, the nature and impact of the load shedding energy crisis need to be fully understood (Koirala and Acharya, 2022), all the while assisting consumers to cope with this crisis while new energy policies are being formulated and implemented. Therefore, this research investigates the attribution of blame after an essential services failure (load shedding), consumer's negative emotions (anger and frustration) and subsequent behavioural outcomes (negative WOM and social support), as well as the possible moderating effect of consumers' actions to reduce demand on the energy generating system (consumer involvement) in a developing country context, South Africa. Additionally, to formulate effectual energy transition policies, the nature and impact of the load shedding energy crisis need to be fully understood (Koirala and Acharya, 2022), all the while assisting consumers to cope with this crisis while new energy policies are being formulated and implemented.

The contribution of this article is threefold. First, the interrelationships between the attribution of blame, the consumer's own volition to remedy the overdemand for energy (consumer involvement), emotions (frustration and anger), and behaviour (negative WOM and social support) are described in the context of an energy policy failure context. Second, this perspective allows for developing more effective communication and service recovery strategies that are more consumer-centric as well as assisting governments when revising their energy policies, including expansion and maintenance plans. Third, this article has an

interdisciplinary perspective using the experiences of consumers to inform energy policy, thereby making theoretical contributions by adding to the services, consumer behaviour, and energy literature. In doing so, casting more light on the attributional process and adding to cross-disciplinary energy research, and aligning with SDG 7.

In the next section, the theoretical underpinning and literature review will be addressed, followed by the research methodology, results, as well as conclusion, and policy implications.

2. Background and literature review

2.1 Load shedding

Load shedding is an energy policy that allows regulators to manage limited capacity. There are several reasons why these planned power outages occur such as technical losses, for example, transmission line overloading or tripping (Guo, 2021; Salman et al., 2023), poor maintenance, human error, equipment failure, cyber-attacks or natural disasters/extreme weather. The latter is the main cause of power disruptions (Salman et al., 2023). For example, load shedding was used as a temporary measure in Japan in 2011-2012 to mitigate the consequences of an earthquake as the public did not respond to the plea to decrease consumption (Sokolowski, 2022). The weather could also add to an already problematic situation as in California in 2000-2001 when a bankrupt power supplier, high prices, the collapse of the California power exchange and extreme weather conditions resulted in load shedding for 31 days (Sokolowski, 2020). Ageing power systems, overdemand or preventing national blackouts (Heas Alhelou et al., 2019; Salman et al., 2023) are additional reasons for utilizing this policy. Other preventative reasons included maintenance, system expansion, grid integration and emergency preparedness. In certain circumstances, such as natural disasters, electricity suppliers may shut off power to areas at risk to protect both customers and utility workers (Salman et al., 2023).

More disturbing causes of power outages include political problems (Obar, 2022) and vandalism. Stealing the wire (for the copper), corruption and bypassing the national grid (e.g., illegally connecting to the power grid) (Salman et al., 2023) is not only evident in other developing countries, but also in South Africa.

Load shedding has been implemented in South Africa since 2008 due to an array of factors such as a lack of maintenance both planned and unplanned (Winkler et al., 2020), overdemand (Kusakana, 2019), corruption, internal mismanagement, design flaws in power stations, capital expenditure shifts, poor quality coal and cable theft (Ateba et al., 2019; Winkler et al., 2020; Schoeman and Saunders, 2018). Between 2008 and 2019, the worst-case-scenario concerning load shedding constituted the shedding of up to 4,000 MW electricity supply for a four-hour rotational period. However, by December 2019 load shedding Stage 6 was implemented, resulting in up to 6,000 MW shedding on a six-hour rotational basis (Du Vegane, 2020). This means that consumers could be without electricity every day for six hours. In 2023 South Africans experienced load shedding almost every day with an average of shedding for four hours per day (Stage 4) (Daily Maverick, 2023). It is thus evident that the reasons for load shedding in South Africa are complex and numerous and that users have experienced it almost daily for a prolonged period (i.e., 16 years and counting).

Load shedding has social, political and economic consequences (Haes Alhelou et al., 2019). For example, mental health is impacted and the longer the duration, the more likely anxiety and stress (Apenteng et al., 2018; Moreno and Shaw, 2019). In Rubin and Rogers (2019) systematic review they found the public often responds positively to power outages by helping others and enjoying the 'cosiness' resulting in more family interactions or earlier bedtimes. However, the longer the outages last the more likely people are to become angry. Trust in

communications from the power supplier appears to also play an important role. For example, the public becomes frustrated when different energy suppliers provide dissimilar customer updates (Miles et al., 2016). While positive effects may be evident short term, these are likely to diminish as time lapses. For example, an analysis of the 1947 Fuel Crisis in Britain (Farmer, 2013) found that restricting energy consumption contributed to low morale and anger towards the government.

Emotions toward energy policies and their underlying roots must be understood and acted upon by policymakers (Contzen *et al.*, 2021). In addition, an energy policy such as planned power outages could also be perceived as a service failure. These failures refer to momentary or lasting interruptions of the consumer's regular service experience and occur when a service provider fails to meet consumer needs and expectations (Fouroudi *et al.*, 2020). When a service failure occurs, individuals attempt to restore their emotional equilibrium by assigning blame and consequently experience a variety of negative emotions such as anger and frustration that, in turn, affect their behaviour (Harris-Walker, 2019; Valentini *et al.*, 2020). However, solving load shedding is not solely dependent on new energy technologies but also on changes in consumers' energy-related behaviours to ensure a significant decrease in demand (Brosch *et al.*, 2014). Most theoretical approaches concentrate on cognitive processes when investigating energy-related behaviours, yet considering emotions may provide a more comprehensive understanding (Brosch *et al.*, 2014), to inform better policy decisions.

2.2 Attribution of blame theory

According to attribution theory, an individual will attribute blame for a negatively perceived event to one of the three dimensions: locus, stability, and controllability (Weiner, 1985). Locus delineates who is perceived to be responsible for the failure while stability speaks to whether

or not the failure is probable to reoccur. Controllability judges if the failure could have been avoided or not (Yen *et al.*, 2004). The attribution process does not happen in isolation as situational, organizational, and individual factors affect how the locus of causality is judged. When a service failure is perceived to be the result of a service provider, the attribution of blame is often followed by feelings of anger and frustration (Meier and Robinson, 2004; Weiner, 1985). Additionally, research has shown that perceived unfairness in the context of energy projects results in consumers experiencing more negative emotions (Huijts, 2018). As different emotions could encourage different behavioural responses, understanding the effect of specific negative emotions related to energy projects becomes vital (Huijts *et al.*, 2022).

South African consumers lack agency and control over the power supplier because of the monopolized state of energy in South Africa. Eskom, the power utility of South Africa, is a state-owned enterprise. Thus, for a planned essential service failure such as load shedding (i.e., an energy policy failure), the locus would be organizational and the attribution of blame, as a result, could lead to consumers feeling angry and frustrated, leading to behavioural outcomes such as employing negative WOM and seeking social support to restore emotional equilibrium.

In addition, consumer involvement affects the attribution of blame (Yen *et al.*, 2004). Energy generation is not a service that is co-created, however, consumers can assist in reducing the strain on the power grid, in an attempt to lessen the demand and match the supply by engaging in energy-saving activities. These could be for example, taking shorter showers, using energy-saving light bulbs, or rinsing dishes with cold water, to name but a few (Brosch *et al.*, 2014). The locus and controllability of causality of power failures can thus be attributed mainly to the dispositional values of the provider (Kulik and Brown, 1979), but the involvement of consumers must be considered. Based on previous research (Nguyen and McColl-Kennedy,

2003; Weiner, 1985) and the theory of attribution, it is posited that South African consumers will attribute blame to the power utility for load shedding and that this attribution of blame will lead to anger and frustration (the effect of which could be weakened by consumer involvement), that, in turn, will lead to coping behaviours such as support-seeking and negative WOM.

Negative WOM is described as undesirable communications by negatively affected consumers that aim to tarnish a business, brand, or in the case of this research, electricity service provider, to which the blame of service failure is attributed (Gelbrich, 2010). Negative WOM is a particularly destructive behavioural outcome because it can shape negative cognitions toward service providers among peers (Mois *et al.*, 2019). Conversely, social support such as communicating and engaging with other individuals (Albrecht and Adelman, 1984) often acts as a “buffer” for consumers in stressful times (Cohen and Willis, 1985) such as an energy policy failure.

2.3 Anger

Specific emotions result in specific behavioural responses in an energy context (Huijts *et al.*, 2022). The attribution of blame has an impact on the intensity of these emotions such as anger (Meier and Robinson, 2004) and resultant behavioural responses (Kulik and Brown, 1979). There is a reciprocal relationship between anger and blame (Quigley and Tedeschi, 1996). Research supports that external blame attribution causes feelings of anger (Gelbrich, 2010; Laros & Steenkamp, 2005). Therefore, the more consumers blame the service provider for the lack of reliable electricity, the greater the possibility of consumers experiencing anger, it is hypothesized that:

H1: Attribution of blame predicts anger towards the energy service provider

Anger impacts consumers' frame of mind, compelling them to act and angry consumers often engage in negative WOM to indirectly strike back at service providers (Kähr *et al.*, 2016). In particular, anger fosters negative WOM as angry consumers often engage in confronting actions toward the blameworthy organization (Bougie *et al.*, 2003; Grégoire & Fisher 2008).

Furthermore, anger is also related to seeking social support (Miers *et al.*, 2007; Strizhakova *et al.*, 2012). However, seeking social support is often employed to confirm one's opinions about the angering incident rather than to elicit guidance from others to change one's perspective (Kuppens *et al.*, 2004). It is evident that a powerful negative emotion such as anger, activates expressive behaviours, such as venting (e.g., negative WOM or seeking social support) to restore consumers' equilibrium (Duhachek, 2005). Therefore, it is hypothesized that:

H2: Anger predicts negative WOM about the energy service provider

H3: Anger predicts seeking social support during load shedding

2.4 Frustration

When a potentially gratifying act or sequence of behaviour is blocked, frustration occurs (Stauss *et al.*, 2005; Tronvoll, 2011). Frustration refers to feeling upset or irritated, particularly due to the incapability to change or accomplish something. Frustration is thus an emotion that is instigated and preceded by an event (Anderson and Bushman, 2002) that is an interruption of a goal (Dollard *et al.*, 1939). This means that a power failure is an event that interrupts the goal of accessing and using electricity. This goal blockage arouses an emotional response in the form of frustration. External attribution of blame tends to lead to frustration (Gelbrich,

2010; Le and Ho, 2020). Thus, in line with the attribution of blame theory and empirical evidence, it is hypothesized that:

H4: Attribution of blame predicts frustration about load shedding

When feeling frustrated, consumers' behaviour revolves around escaping (coping with) the negative emotion (frustration). Research shows that this type of emotion fosters seeking social support (Menon and Dubé 2007; Yi and Baumgartner 2004). Individuals often seek empathy and understanding from others by venting their frustration. Yet, the negative feeling associated with goal interruption may lead frustrated consumers to seek other options for sharing their negative experiences such as negative WOM (Gelbrich, 2010; Laros & Steenkamp, 2005). A consumer who has negative emotions from a service failure is inclined to share negative messages about their experience with other consumers (Li *et al.*, 2015). Frustrated consumers are likely to turn to people in their social sphere because they think that nobody, including the service provider, can rectify the situation (Lazarus 1991; Weiner 1985). Thus, although frustration is typically associated with seeking social support, frustrated consumers might also vent their frustration via negative WOM. It is therefore hypothesized that:

H5: Frustration predicts negative WOM about the energy service provider

H6: Frustration predicts seeking social support during load shedding

2.5 Mediation: Interrelationships between the attribution of blame, anger, frustration, negative WOM, and seeking social support

When load shedding occurs, individuals try to restore their emotional equilibrium by assigning blame and as a result experience a variety of negative emotions (i.e., anger and frustration) that

then affect their behavioural outcomes (Folkes, 1984; Harris-Walker, 2019; Valentini *et al.*, 2020). Moreover, specific emotions lead to specific behavioural responses in an energy context as stated above (Huijts *et al.*, 2022). External attribution of blame could trigger anger (Gelbrich, 2010), which in turn, could result in negative WOM and seeking social support (Strizhakova *et al.*, 2012). Furthermore, external attribution of blame may trigger frustration (Le and Ho, 2020), which in turn, may result in seeking social support (Menon and Dubé, 2007) and negative WOM (Li *et al.*, 2015). Emotions such as anger and frustration can thus be the mechanisms through which the attribution of blame affects behavioural outcomes. Therefore, we hypothesized that:

H7: Frustration mediates the relationship between attribution of blame and negative WOM about the energy service provider

H8: Frustration mediates the relationship between attribution of blame and seeking social support during load shedding

H9: Anger mediates the relationship between attribution of blame and negative WOM about the energy service provider

H10: Anger mediates the relationship between attribution of blame and seeking social support during load shedding

2.6 Moderation: Interrelationships between the attribution of blame, consumer involvement, anger and frustration

Consumer involvement plays a central part in the process of attribution of blame (Yen *et al.*, 2004). Effective energy transition depends on the advances of new energy technologies but also on consumers' involvement in energy-related behaviours to reduce demand (Brosch *et al.*, 2014). There is an association between consumers' intention to engage in energy-reducing activities and emotions (Brosch *et al.*, 2014). In particular, two of the attribution dimensions

relate to consumer involvement, locus (who caused the failure) and control (could the failure have been prevented). Although these are located mainly at the side of the electricity utility provider, consumers' involvement or participation in energy-saving activities could help prevent (controllability) load shedding, and the locus is shared, even only marginally, on the side of the consumers as their lack of energy saving may be indirectly to blame (locus) for the load shedding. Locus attributions are influenced by the consumers' participation, be it physical or mental (Cermak *et al.*, 1994). The locus and controllability dimensions influence whether consumers attribute blame and are angry (Folkes, 1984). Furthermore, attribution in reaction to service failure is influenced by individual factors (e.g., consumer involvement) (Yen *et al.*, 2004). Consumer participation or involvement includes information sharing, personal interaction, and responsible behaviour (Ennew and Binks, 1999). The latter would be reflected in engaging in energy-saving activities. Consumers with low involvement are more likely to blame a service provider for a service failure – implying that high-involvement consumers may perhaps act differently (Folkes, 1984; Folkes and Kotsos, 1986). Consumer involvement is thus operationalized in this study as engaging in energy-saving activities to lessen the strain on the power grid. It is hypothesized that:

H11: Consumer involvement moderates the relationship between attribution of blame and frustration during load shedding

H12: Consumer involvement moderates the relationship between attribution of blame and anger towards the energy service provider

Figure 1 presents the conceptual model based on the literature discussion above.

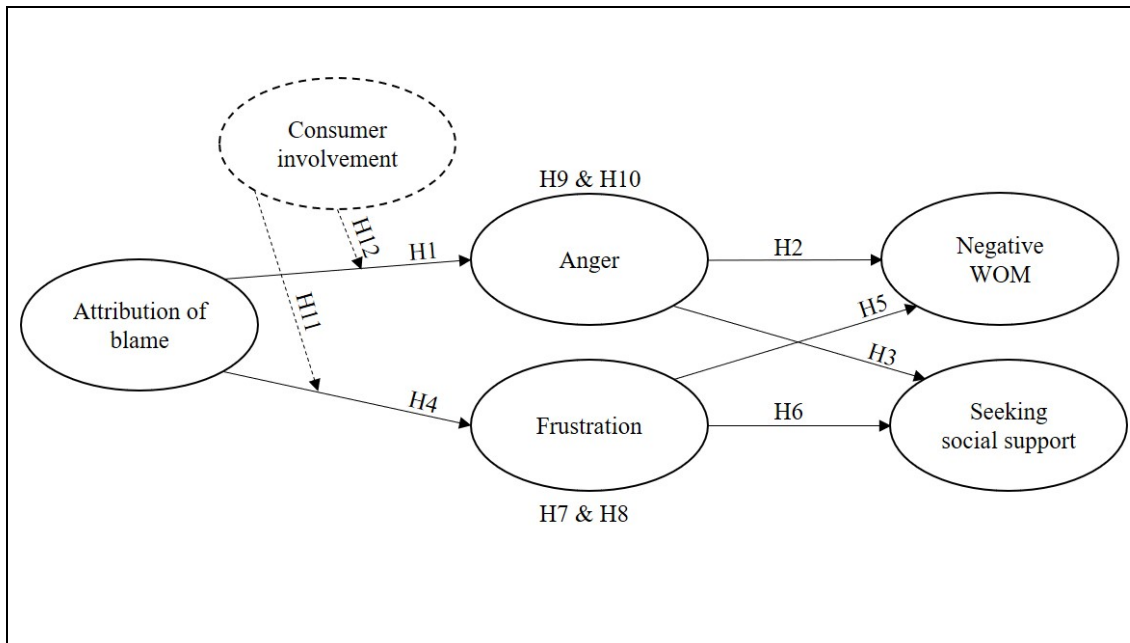


Figure 1: Conceptual model

2 Methodology

3.1 Sample and data collection

The population for the study included adult (18 years and above) South Africans who experienced load shedding and convenience sampling resulted in 370 usable responses. Quantitative data was obtained through a consumer panel. The online questionnaire was distributed via Qualtrics, after gaining ethical clearance and when no significant problems were revealed by the pre-testing. Participants had to recall their load shedding experiences and then complete the questionnaire. While every effort has been made to ensure sufficient responses for the SEM data analysis technique, using widely accepted rules of thumb (i.e. more than 300 responses, Tabachnick & Fidell, 2013; the ratio of observations to estimated parameters ($N:q$) of 10 to 1, Schreiber *et al.*, 2006), the sampling method and size necessitates caution when interpreting findings as generalizability is constrained.

3.2 Measurement instrument

The measurement instrument comprised of questions about demographics, electricity use, energy-saving behaviour, and motivations as well as the theoretical constructs: attribution of blame, anger, frustration, negative WOM, and seeking social support. Seven-point Likert scales were used for all scales, adapted from existing studies to reflect a planned services failure e.g. loss of energy to certain geographical areas (that is, load shedding), with scale points ranging from 1 (Strongly disagree) to 7 (Strongly agree).

The 5-item *attribution of blame* scale included for example, “The reason for load shedding is something the power utility had control over” (Gelbrich, 2010), while *anger* (“I feel furious about the power utility’s decision to load-shed”) and *frustration* (“I feel annoyed at load shedding”) were both measured with 3-item scales adapted from Gelbrich (2010). The behaviour outcome scales from Hilverda and Kuttschreuter (2018) were used with 3-items for *negative WOM* such as, “I talked to spread negative word of mouth about the government” and *seeking social support* (4-items) such as “I talk to feel better.” Consumer involvement was measured with one item, namely “Do [you] engage in energy-saving activities to lessen the strain on the power grid?” ranging from 1 (Not at all) to 7 (Extensively).

3.3 Data analysis

SPSS was used for descriptive statistics while reliability and validity were established through confirmatory factor analysis (AMOS). Structural equation modeling (SEM in AMOS) was done to test the hypotheses. Bollen-Stine bootstrapping, including the bias-corrected confidence interval, was used to address the asymmetry and non-normal data (Bollen & Stine 1990; Enders 2005).

Concerning model fit indices, we considered between a 2:1 and 3:1 ratio (Kline 2011) for the normed Chi-square, with values of 0.90 or higher (Bagozzi and Yi 1988) for the comparative fit index (CFI), and Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) values ranging up to 0.08 (Van de Schoot *et al.*, 2012) as appropriate.

4. Results

4.1 Sample profile

A total of 370 adult South African respondents who have experienced load shedding partook in the study. The majority of respondents (68.1%) have considered alternative energy sources, including solar power (57.8%), gas appliances (37%), a generator (32.4%), uninterrupted power supply (UPS) (8.4%), wind power (8.4%), hydropower (3.5%) and geothermal power (2.4%). The majority of respondents indicated that alternative energy sources are too expensive (70.8%) and the maintenance is too high (33.5%) as reasons that may deter them from installing alternative energy sources. On a 7-point Likert scale, respondents answered towards the upper end of the scale (mean = 5.17, SD = 1.75) that they engage in energy-saving activities to lessen the strain on the power grid. The aforementioned item was used in the moderation analysis.

Table 1 gives an overview of specific energy-saving activities respondents engaged in on a 7-point Likert scale, where 1 = Never, 4 = Sometimes, and 7 = Always.

Energy-saving activity	Mean	SD
Use energy-saving light bulbs	5.59	1.81
Bought more energy-efficient appliances	4.94	1.79
Switching off lights in unused rooms	6.20	1.55
Line drying of laundry (no dryer)	5.76	1.81

Do not leave appliances on standby	5.52	1.88
Take shorter showers	5.15	1.87
Rinsing dishes with cold water	4.85	2.16

Table 1: Engagement in specific energy-saving activities

The sample included an equal amount of male (n=185) and female (n=185) respondents, with the youngest respondent born in 2002 and the oldest respondent born in 1956. Preliminary analyses exploring gender differences using independent sample t-tests including effect sizes (independent of sample size), indicated no large practically significant effects which would be meaningful to consider in further analyses (Cohen, 1988), and exploring age differences based on the year in which respondents were born using Spearman rho correlations also revealed weak correlations (Cohen, 1988). Therefore, no further analyses regarding gender and age differences were included.

4.2 Validity, reliability, and measurement model

Confirmatory factor analysis was used to assess convergent and discriminant validity of the scales. Three items from the attribution of blame scale with low standardized weights negatively affecting the average variance extracted were removed from further analyses (Hair *et al.*, 2014). The average variance extracted (AVE) for all factors was acceptable (Fornell and Larcker 1981), with all factors achieving values above 0.5, in addition to confirming convergence in measurement (Bagozzi 1981). These convergent and discriminant values along with the reliability statistics are presented in Table 2 below.

Constructs and items	
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Attribution of blame (<i>Instruction: Indicate the degree to which you agree with the following statements given load shedding</i>)	S.W.	AVE	Spearman-Brown coefficient	C.R.
To prevent load shedding, there are actions Eskom could take but has not.	0.687	0.528	0.689	0.690
Eskom is responsible for the load shedding.	0.764			
Frustration (<i>Instruction: Indicate the degree to which you agree with the following statements given load shedding</i>)	S.W.	AVE	α	C.R.
I feel frustrated about load shedding.	0.794	0.699	0.876	0.874
I feel disturbed by load shedding.	0.634			
I feel annoyed at load shedding.	0.669			
Anger (<i>Instruction: Indicate the degree to which you agree with the following statements given load shedding</i>)	S.W.	AVE	α	C.R.
I feel angry with Eskom about load shedding.	0.925	0.829	0.933	0.936
I feel mad with Eskom because of load shedding.	0.948			
I feel furious about Eskom's load shedding decisions.	0.856			
Negative WOM (<i>Instruction: Indicate whether you would talk to other people about load shedding by indicating the degree to which you would agree with the following statements</i>)	S.W.	AVE	α	C.R.
I would spread negative word-of-mouth about Eskom.	0.904	0.650	0.832	0.845
I would say things to damage Eskom's reputation.	0.846			
I would warn others not to rely on Eskom.	0.646			
Social support (<i>Instruction: Indicate whether you would talk to other people about load shedding for the following reasons by indicating the degree to which you would agree with the following statements</i>)	S.W.	AVE	α	C.R.
I would get some comfort.	0.748	0.537	0.812	0.818
I would reduce my negative feelings.	0.837			
I would feel better.	0.795			
I would share my feelings with others.	0.504			

Note: α = Cronbach's alpha; C.R. = Jöreskog's rho (composite reliability)

Table 2: Standardized weights, AVE, and reliabilities (α and C.R.)

From Table 2 it is evident that all factors were reliable, as the Spearman-Brown's coefficient (Eisinga *et al.*, 2013), Cronbach's alpha, and Jöreskog's rho, were above 0.6, (Bagozzi and Yi 1988; Fornell and Larcker, 1981). The square root of the AVE and correlations for the constructs of our study are provided in Table 3.

Construct	Attribution of blame	Frustration	Anger	Negative WOM	Support-seeking
Attribution of blame	0.727*				
Frustration	0.538	0.836*			
Anger	0.708	0.710	0.911*		
Negative WOM	0.482	0.222	0.400	0.806*	
Social support	0.161	0.082	-0.043	0.156	0.732*

Note: *values in the main diagonal are the square root of the average variance extracted (AVE).

Table 3: Discriminant validity

Discriminant validity is confirmed with the square root of the AVE being higher than the correlation between two factors in all cases (see Table 3) (Fornell and Larcker 1981). A good measurement model fit for the data is evident from the relative Chi-square ($CMIN/df = 207.696 / 80 = 2.596$) below 3, as well as the CFI (0.960), TLI (0.948), and RMSEA (0.066, [LO90 = 0.055; HI90 = 0.077]).

4.3 Structural model

The structural model fit the data well with the relative Chi-square ($CMIN/df = 220.527 / 82 = 2.689$) below 3, supported by the CFI (0.957), TLI (0.945), and RMSEA (0.068, [LO90 = 0.057; HI90 = 0.079]).

4.4 Results of hypothesis testing

The structural equation modeling outcome of the direct hypothesized relationships (Ha1 to Ha6) is presented in Table 4 with the Bias Corrected Confidence Interval (BBCI) set at 95%.

Relationship		S.W.	p-value [Bias corrected confidence interval]	Outcome
Ha1: Attribution of blame	→ Anger	0.969**	$p = 0.018$ [BBCI Lower = 0.862; BBCI Upper = 1.066]	Supported

Ha2: Anger	→	Negative WOM	0.494**	$p = 0.008$ [BBCI Lower = 0.382; BBCI Upper = 0.660]	Supported
Ha3: Anger	→	Social support	-0.171*	$p = 0.095$ [BBCI Lower = -0.321; BBCI Upper = -0.011]	Supported
Ha4: Attribution of blame	→	Frustration	0.732**	$p = 0.007$ [BBCI Lower = 0.620; BBCI Upper = 0.842]	Supported
Ha5: Frustration	→	Negative WOM	-0.123	$p = 0.159$ [BBCI Lower = -0.282; BBCI Upper = 0.037]	Not supported
Ha6: Frustration	→	Social support	0.197**	$p = 0.043$ [BBCI Lower = 0.042; BBCI Upper = 0.370]	Supported

Note: **significant at the $p < 0.05$, two-tailed; *significant at the $p < 0.1$, two-tailed.

Table 4: Direct hypothesized relationships

From Table 4 it is evident that all hypotheses except Ha5 were supported in contrast to Gelbrich *et al.*'s (2010) finding that frustration may also result in negative WOM. Specifically, the strongest relationships exist between the attribution of blame and anger ($\beta = 0.969$, $p = 0.018$), as well as between the attribution of blame and frustration ($\beta = 0.732$, $p = 0.007$). Findings support the attribution of blame literature that external attribution of blame results in anger (Gelbrich, 2010; Laros & Steenkamp, 2005) and frustration (Le & Ho, 2020). Anger as strong negative emotion is a grave cause for concern as supported by these findings and previous research as anger is related to negative WOM (Kähr *et al.*, 2016) and seeking social support (Strizhakova *et al.*, 2012).

The mediation analyses for Ha7 to Ha10 are presented in Table 5 by considering the separate mediation effects of frustration and anger respectively.

Relationship	S.W.	p -value [Bias corrected confidence interval]	Outcome
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Ha7: Attribution of blame	Frustration	Negative WOM	-0.041	$p = 0.581$ [BBCI Lower = - 0.150; BBCI Upper = 0.097]	Not supported
Ha8: Attribution of blame	Frustration	Social support	0.215**	$p = 0.013$ [BBCI Lower = 0.063; BBCI Upper = 0.448]	Supported
Ha9: Attribution of blame	Anger	Negative WOM	0.634**	$p = 0.005$ [BBCI Lower = 0.434; BBCI Upper = 1.057]	Supported
Ha10: Attribution of blame	Anger	Social support	-0.195*	$p = 0.065$ [BBCI Lower = - 0.417; BBCI Upper = -0.037]	Supported

Note: **significant at the $p < 0.05$, two-tailed; *significant at the $p < 0.1$, two-tailed; BBCI Lower = Lower level confidence interval; BBCI Upper = Upper-level confidence interval.

Table 5: Indirect hypothesized relationships (mediation)

From Table 5 it is evident that frustration is the mechanism through which attribution of blame is positively associated with consumers seeking social support. In addition, anger is the mechanism through which attribution of blame is positively associated with negative WOM and negatively associated with seeking social support. Hereby Ha8 to Ha10 is supported, but Ha7 stating that frustration mediates the relationship between attribution of blame and negative WOM is not supported. As evident in Table 5 above, results indicate that for respondents in this study, frustration is more likely to result in seeking social support, while anger is more likely to result in negative WOM. These findings confirm that specific emotions lead to specific behavioural responses in the energy context (Huijts *et al.*, 2002) which emphasizes the importance of considering specific emotions in energy research.

To examine the moderation effect of involvement in energy-saving activities to lessen the strain on the power grid on the relationships between attribution of blame and frustration as well as between attribution of blame and anger, standardized variables were used for the model in AMOS. Table 6 presents the results of the moderation analysis for Ha11 to Ha12.

	DV	Moderator	Estimate	SE	p-value	Outcome
Ha11	Frustration	Attribution of blame X Less strain on the power grid	-0.093*	0.040	0.019	Supported
Ha12	Anger	Attribution of blame X Less strain on the power grid	-0.016	0.036	0.667	Not supported

Table 6: Indirect hypothesized relationships (moderation using standardized variables)

From Table 6 it is evident that the interaction between attribution of blame and involvement in energy-saving activities to lessen the strain on the power grid has a significant negative effect on the relationship between attribution of blame and frustration. Ha11 is therefore supported. Therefore, the interaction effect of Ha11 is plotted in Figure 3 below. Ha12 stating that consumer involvement moderates the relationship between attribution of blame and anger was not supported.

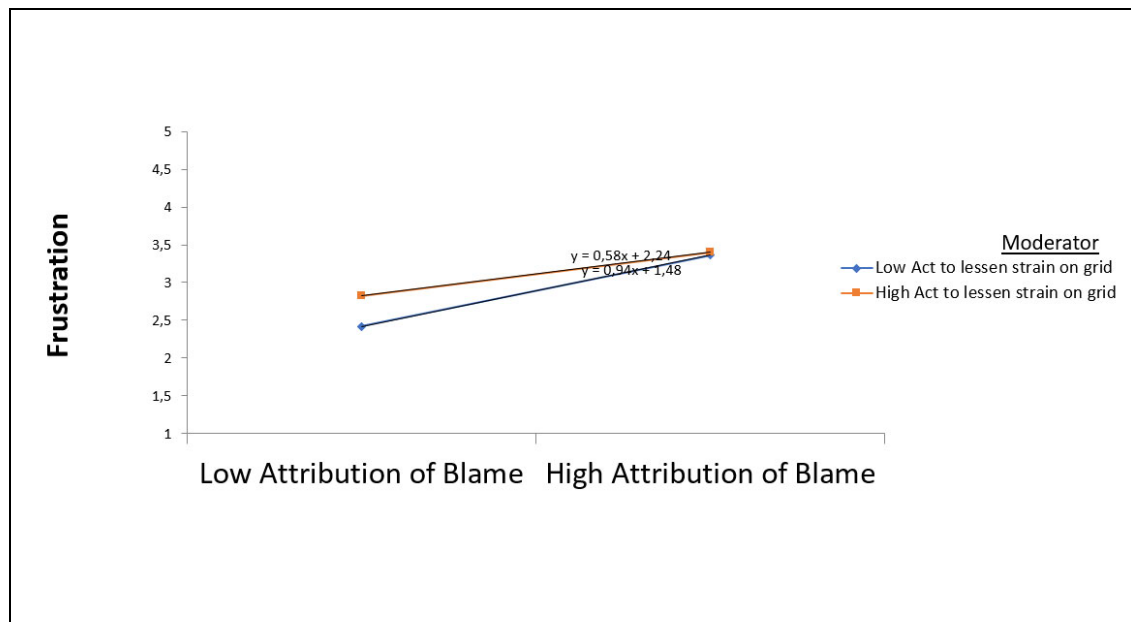


Figure 3: Moderation effect of involvement in energy-saving activities to lessen the strain on the power grid

Based on Figure 3 above, the involvement in energy-saving activities to lessen the strain on the power grid weakens the positive relationship between attribution of blame and frustration. Findings thus confirm Yen *et al.*'s (2004) contention that consumer involvement is an important individual variable to consider in the attribution of blame context, more so when considering energy-related behaviours to reduce demand (Brosch *et al.*, 2014) as related to frustration.

5. Conclusion and policy implications

Access to reliable electricity supply is imperative for progress. However, consumers in numerous developing countries such as South Africa do not have access to reliable electricity supply – owing to power cuts and power outages (i.e., load shedding). These service failures put consumers under pressure and hamper energy modernization (Koirala and Acharya, 2022). Focusing solely on the impact of electrification in developing countries (Barron and Torero, 2017), without taking into account the reliability of its supply, could result in misjudging the advantage of access to electricity and its direct and indirect impact on consumers (Chakravorty *et al.*, 2014). Improving the reliable supply of electricity for a successful transition toward modern energy (Koirala, and Acharya, 2022) is essential, however, given the long-time frame to accomplish this, we suggest practical interim measures and strategies to cope with the existing energy crises.

Sokolowski and Heffron (2022) consider energy policy failures as a passing event and propose an energy justice framework for learning from such an event. Our research extends this view on energy policy failure by considering load shedding as an ongoing energy policy failure and offers insight into managing specific stakeholders during this time. Load shedding is an energy policy allowing the regulatory agent to manage limited capacity. Simultaneously, load

shedding has a detrimental effect on consumers and the economy. We offer a glimpse into the wider societal struggles of South Africa's energy policy, acknowledged by Schmid and Lumsden (2023), using a quantitative research design to explore consumers' coping with the perceived energy policy failure. It is evident that the policy of planned load shedding to cope with electricity supply problems is viewed by consumers as service failures, resulting in South Africans blaming the electricity provider. The government and the electricity provider should consider making consumers feel part of the problem resolution (as suggested by Antonetti et al., 2020) through public consultations, customer surveys, and online reviews, given the importance of consumer involvement in the attribution of blame. A specific recommendation for the South African Minister of Electricity (appointed on 6 March 2023) is to host bi-annual social media competitions where consumers can share ideas on managing electricity demand and energy-saving initiatives which may be implemented into Government policy.

There is growing evidence that energy policymakers should consider the public's emotions and ethical concerns (Contzen et al., 2021; Huijts *et al.*, 2022) while energy security is a prominent issue in recent energy policy discussions (Sirin *et al.*, 2023). We build on this idea by showing how the public's attribution of blame for energy policy failures, and the public's own volition to reduce energy demand, impact emotions and resulting coping behaviour. Practically, we suggest first, Government's willingness to accept responsibility for the service failure could alleviate consumer anger and second, to develop and communicate energy policy clearly outlining actionable plans to address the current unreliable, insufficient energy supply and to continually update consumers on how the new policy implementation is progressing to address consumer frustration. Given that emotions could affect how consumers respond to energy policies (Huijts, 2022) it is important to provide an outlet for consumers' negative emotions to increase the chance of their buy-in into the new policies. Angry and frustrated consumers are

not very likely to respond positively to any new policies unless they feel heard and understood. A communication strategy suggestion is to provide a toll-free complaint line managed by an AI robot that acknowledges and empathizes with consumers to allow consumers the opportunity to vent anger and frustration.

In South Africa, the electricity utility has increased the price of electricity in an attempt to decrease demand (Ye *et al.*, 2018) as the regulatory framework for energy policy is the Government, which, compared to other developing countries (i.e., Sumarno *et al.*, 2022) prohibits market competition to protect the public interest. However, energy consumption patterns are considered habitual, and often consumers do not act rationally, and such price tariff increases founded on the cost-benefit approach may not result in decreased consumption (Lee *et al.*, 2020). Behavioural change is important to handle the current overdemand crises but also for a successful energy transition. While there is movement in legislation for private energy generation and tax rebates on installing solar power, working towards a just energy transition remains a work-in-progress for South Africa. Furthermore, given that participating in energy-saving activities dampens the effect of attribution of blame and frustration, governments can use this not only to better manage consumers' emotions during the load shedding crises but also to foster behavioural changes for sustainable energy consumption in the future. The government and the electricity provider's communication strategies must address the extent to which consumers can contribute to the prevention of load shedding by saving energy to the benefit of the individual but also the community at large. A collective energy-saving policy recommendation for example may be that every suburb where geysers are switched off for 18 hours of the day will have one stage less load shedding (i.e. stage 3 instead of state 4 load shedding according to the national roster). The use of targeted information campaigns may change consumer's emotional response toward load shedding and energy-saving activities. For

example, marketing campaigns for energy-efficient products or encouraging energy-saving activities emphasizing the positive emotions resulting from responsible behaviour (e.g., pride), while also stating the possibly negative consequences such as putting more pressure on the electricity grid is recommended.

6. References

Acharya, B., Adhikari, S., 2021. Household energy consumption and adaptation behaviour during crisis: evidence from Indian economic blockade on Nepal. *Energy Policy*, 148, 111998.

Anderson, C.A., Bushman, B.J., 2002. Human aggression. *Annual Review of Psychology*, (53), 27-51.

Antonetti, P., Crisafulli, B., Katsikeas, C.S., 2020. Does it really hurt? Making sense of varieties of anger. *Psychology & Marketing*, 37(11), 1465-1483.

Albrecht, T.L., Adelman, M.B., 1984. Social support and life stress: New directions for communication research. *Human Communication Research*, 11(1), 3-32.

Apenteng, B.A., Opoku, S.T., Ansong, D., Akowuah, E.A., Afriyie-Gyawu, E., 2018. The effect of power outages on in-facility mortality in healthcare facilities: Evidence from Ghana. *Global Public Health*, 13, 545-555.

Ateba, B.B., Prinsloo, J.J., Gawlik, R., 2019. The significance of electricity supply sustainability to industrial growth in South Africa. *Energy Reports*, 5(1),1324-1338.

Baik, M.S., Morgan, G., Davis, A.L., 2018. Providing limited local electric service during a major grid outage: a first assessment based on consumer willingness to pay. *Risk Analysis*, 38(2), 272-282.

Bagozzi, R.P., 1981. Evaluating structural equation models with unobservable variables and measurement error: A comment. *Journal of Marketing Research*, 18(3), 375-381.

Bagozzi, R.P., Yi, Y., 1988. On the Evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-64.

Barron, M., Torero, M., 2017. Household electrification and indoor air pollution. *Journal of Environmental and Economics Management*, 86, 81–92.

Bohlmann, J.A., Inglesi-Lotz, R., 2021. Examining the determinants of electricity demand by South African households per income level. *Energy Policy*, 148, 111901.

Bollen, K.A., Stine, R., 1990. Direct and indirect effects: classical and bootstrap estimates of variability. *Sociological Methodology*, 20, 115-140.

Bonifield, C., Cole, C., 2007. Affective responses to service failure: Anger, regret, and retaliatory versus conciliatory responses. *Marketing Letters*, 18(1), 85-99.

Bougie, R., Pieters, R., Zeelenberg, M., 2003. Angry customers don't come back, they get back: The experience and behavioural implications of anger and dissatisfaction in services. *Journal of the Academy of Marketing Science*, 31(4), 377–393.

Brosch, T., Patel, M. K., Sander, D., 2014. Affective influences on energy-related decisions and behaviours. *Frontiers in Energy Research*, (2)11, 1-12.

Burgess, R., Greenstone, M., Ryan, N., Sudarshan, A., 2020. The consequences of treating electricity as a right. *Journal of Economic Perspectives*, 34, 145-169.

Cermak, D.S., File, K.M., Prince, R.A., 1994. Customer participation in service specification and delivery. *Journal of Applied Business Research*, 10(2), 90-97.

Chakravorty, U., Pelli, M., Marchand, U.B., 2014. Does the quality of electricity matter? Evidence from rural India. *Journal of Economic Behaviour and Organization*, 107, 228–247.

Cohen, S., Wills, T.A., 1985. Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310-357.

Cohen, J. 1988. *Statistical power analysis for the behavioural sciences*. 2nd ed. Hillsdale, NJ: Erlbaum.

Contzen, N., Perlaviciute, G., Sadat-Razavi, P., Steg, L., 2021. Emotions toward sustainable innovations: a matter of value congruence. *Frontiers in Psychology*, 12, 2583.

Daily Maverick. 2023. It's now official: South Africa has now had more load shedding in 2023 to date than in 2022 combined. Available at: <https://www.dailymaverick.co.za/article/2023-05-12-its-now-official-south-africa-has-now-had-more-load-shedding-in-2023-to-date-than-in-2022-combined/> (Accessed 22 January 2024).

Dollard, J., Doob, L., Miller, N., Mowrer, O.H., Sears, R., 1939. Frustration and aggression. London, UK: Yale University Press.

Duhachek, A., 2005. Coping: A multidimensional, hierarchical framework of responses to stressful consumption episodes. *Journal of Consumer Research*, 32(1), 41-53.

Du Vegane, G., 2020. South Africa Comes to Standstill with Eskom's Load Shedding. *Engineering and Mining Journal*. Available from: <https://www.emj.com/departments/this-month-in-coal/south-africa-comes-to-standstill-witheskoms-load-shedding/> (Accessed on 21 January 2024).

Eisinga, R., te Grotenhuis, M., Pelzer, B., 2013. The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health*, 58, 637-642.

Enders, C.K., 2005. An SAS macro for implementing the modified Bollen-Stine bootstrap for missing data: Implementing the bootstrap using existing structural equation modeling software. *Structural Equation Modeling*, 12(4), 620-641.

Ennew, C.T., Binks, M.R., 1999. Impact of participative service relationships on quality, satisfaction and retention: an exploratory study. *Journal of Business Research*, 46(2), 121-132.

Falcone, P.M., 2023. Sustainable energy policies in developing countries: A review of challenges and opportunities. *Energies*, 16(18), 6682.

Farmer, R., 2013. All work and no play: British leisure culture and the 1947 fuel crisis. *Contemporary British History*, 27(1), 22-43.

Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

Fouroudi, P., Kitchen, P. France, N., Marvi, R., Akarsu, T.N., Uddin., H., 2020. A bibliometric investigation of service failure literature and a research agenda. *European Journal of Marketing*, 54, 2575-2619.

Folkes, V.S., 1984. Consumer Reactions to Product Failure: An attributional approach *Journal of Consumer Research*, 10(4), 398–409.

Folkes, V.S., Kotsos, B., 1986. Buyers' and sellers' explanations for product failure: Who done it? *Journal of Marketing*, 50(2), 74-80.

Gelbrich, K., 2010. Anger, frustration, and helplessness after service failure: coping strategies and effective informational support. *Journal of the Academy of Marketing Science*, 38(5), 567-585.

Gillham, E., Nolden, C., Banks, N., Parrish, B., Mose, T.M., Sugar, K., 2023. Facilitating application of the energy service concept: Development of an analytical framework. *Energy Policy*, 178, 113584.

Grégoire, Y., Fisher, R.J., 2008. Customer betrayal and retaliation: when your best customers become your worst enemies. *Journal of the Academy of Marketing Science*, 36, 247-261.

Guo, L., Liang, C., Zocca, A., Low, S.H., Wierman, A., 2021. Line failure localization of power networks part II: Cut set outages. *IEEE Transactions on Power Systems*, 36 (5), 4152-4160.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2014. *Multivariate data analysis*. Harlow, UK: Pearson Education Limited.

Harrison-Walker, L.J., 2019. The effect of consumer emotions on outcome behaviours following service failure. *Journal of Services Marketing*, 33(3), 285-302.

Haes Alhelou, H., Hamedani-Golshan, M.E., Njenda, T.C., Siano, P., 2019. A survey on power system blackout and cascading events: Research motivations and challenges. *Energies*, 12(4), 682.

Hilverda, F., Kuttischreuter, M., 2018. Online information sharing about risks: The case of organic food. *Risk Analysis*, 38(9), 1904-1920.

Hui, M.K., Ho, C.K., Wan, L.C., 2011. Prior relationships and consumer responses to service failures: A cross-cultural study. *Journal of International Marketing*, 19(1), 59-81.

Huijts, N.M.A., 2018. The emotional dimensions of energy projects: anger, fear, joy and pride about the first hydrogen fuel station in The Netherlands. *Energy Research and Social Science*, 44, 138–145.

Huijts, N. M., Contzen, N., Roeser, S., 2022. Unequal means more unfair means more negative emotions? Ethical concerns and emotions about an unequal distribution of negative outcomes of a local energy project. *Energy Policy*, 165, 112963.

Kähr, A., Nyffenegger, B., Krohmer, H., Hoyer, W.D., 2016. When hostile consumers wreak havoc on your brand: The phenomenon of consumer brand sabotage. *Journal of marketing*, 80(3), 25-41.

Khamitov, M., Grégoire, Y., & Suri, A., 2020. A systematic review of brand transgression, service failure recovery and product-harm crisis: integration and guiding insights. *Journal of the Academy of Marketing Science*, 48(3), 519-542.

Kulik, J.A., Brown, R., 1979. Frustration, attribution of blame, and aggression. *Journal of Experimental Social Psychology*, 15(2), 183-194.

Kline, R.B., 2011. Principles and practice of structural equation modelling. 3rd edition. The Guilford Press, New York, New York.

Koirala, D.P., Acharya, B., 2022. Households' fuel choices in the context of a decade-long load shedding problem in Nepal. *Energy Policy*, 162, 112795.

Kruger, W., Eberhard, A., 2023. The impact of competition, trust and capital on renewable energy auction outcomes in sub-Saharan Africa: Analysing auctions in South Africa, Zambia and Namibia. *Energy Policy*, 178, 1-19, 113572

Kuppens, P., Van Mechelen, I., Meulders, M., 2004. Every cloud has a silver lining: Interpersonal and individual differences determinants of anger-related behaviours. *Personality and Social Psychology Bulletin*, 30, 1550–1564.

Laros, F.J., Steenkamp, J.B.E., 2005. Emotions in consumer behaviour: a hierarchical approach. *Journal of Business Research*, 58(10), 1437-1445.

Lazarus, R.S., 1991. Emotion and adaptation. Oxford University Press.

Lazarus, R. S., Folkman, S., 1984. Stress, appraisal and coping. New York: Springer consumers.

Le, A.N.H., Ho, H.X., 2020. The behavioural consequences of regret, anger, and frustration in service settings. *Journal of Global Marketing*, 33(2), 84-102.

Lee, E., Kang, M., Song, J., Kang, M., 2020. From intention to action: Habits, feedback and optimizing energy consumption in South Korea. *Energy Research and Social Science*, 64, 101430.

Li, Y., He, X., Hu, D., 2015. Information seeking and sharing in virtual communities: a case study of Chinese I.T. professionals. *ASIST*, 1-10.

Lubbe, I., De Meyer-Heydenrych, C., 2019. The influence of service failures on customer emotions amongst banking customers in Gauteng. *Journal of Contemporary Management*, 16(1), 376-401.

Meier, B.P., Robinson, M.D., 2004. Does quick to blame mean quick to anger? The role of agreeableness in dissociating blame and anger. *Personality and Social Psychology Bulletin*, 30(7), 856-867.

Meles, T.H., 2020. Impact of power outages on households in developing countries: Evidence from Ethiopia. *Energy Economics*, 91: 1-11.

Menon, K., Dubé, L., 2007. The effect of emotional provider support on angry versus anxious consumers. *International Journal of Research in Marketing*, 24(3), 68-275.

Miers, A.C., Rieffe, C., Meerum Terwogt, M., Cowan, R., Linden, W., 2007. The relation between anger coping strategies, anger mood and somatic complaints in children and adolescents. *Journal of Abnormal Child Psychology*, 35(4), 653-664.

Miles, S.B., Jagielo, N., Gallagher, H., 2016. Hurricane Isaac power outage impacts and restoration. *Journal of Infrastructure Systems*, 22(1), 05015005.

Moreno, J., Shaw, D., 2019. Community resilience to power outages after disaster: A case study of the 2010 Chile earthquake and tsunami. *International Journal of Disaster Risk Reduction*, 34, 448-458.

Nguyen, D.T., McColl-Kennedy, J.R., 2003. Diffusing customer anger in service recovery: A conceptual framework. *Australasian Marketing Journal*, 11(2), 46-55.

Obar, E.A., Touati, A., Adekanle, O.S., Agajelu, B., Moulebe, L.P., Rabbah, N., 2022. Navigating the prevailing challenges of the Nigerian power sector. *WSEAS Transactions on Power Systems*, 17, 234-243.

Quigley B.M., Tedeschi J.T., 1996. Mediating Effects of Blame Attributions on Feelings of Anger. *Personality and Social Psychology Bulletin*, 22(12), 1280-1288.

Pegels, A., 2010. Renewable energy in South Africa: Potentials, barriers and options for support. *Energy Policy*, 38(9), 4945-4954.

Rubin, G.J., Rogers, M.B., 2019. Behavioural and psychological responses of the public during a major power outage: A literature review. *International Journal of Disaster Risk Reduction*, 38, 101226.

Salman, H.M., Pasupuleti, J., Sabry, A.H., 2023. Review on causes of power outages and their occurrence: Mitigation strategies. *Sustainability*, 15(20), 15001.

Schoeman, T., Saunders, M., 2018. The impact of power outages on small businesses in the City of Johannesburg. In 10th International Conference on Education, Business, Humanities and Social Sciences Studies.

Schmid, N., Lumsden, C., 2023. Sowing the seeds of change: Policy feedback and ratcheting in South African energy policy. *Energy Policy*, 178, 1-13, 113597.

Schreiber, J.B., Stage, N.A., Barlow, E.A. & King, J. 2006. Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, 99(6), 323-338.

Sengupta, A. S., Balaji, M., Krishnan, B.C., 2015. How customers cope with service failure? A study of brand reputation and customer satisfaction. *Journal of Business Research*, 68(3), 665–674.

Sirin, S.M., Camadan, E., Erten, I.E., Zhang, A.H., 2023. Market failure or politics? Understanding the motives behind regulatory actions to address surging electricity prices. *Energy Policy*, 180, 113647.

Sokołowski, M.M., 2022. Energy transition of the electricity sectors in the European union and Japan: regulatory models and legislative solutions. Cham: Palgrave Macmillan.

Sokołowski, M.M., 2020. Balancing energy regulation: a day-watchman approach. In *Economic Freedom and Market Regulation*, 167-186.

Sokolowski, M.M., Heffron, R.J., 2022. Defining and conceptualising energy policy failure: The when, where, why and how. *Energy Policy*, 161, 1-10. 112745.

Stauss, B., Schmidt, M., Schoeler, A., 2005. Customer frustration in loyalty programs. *International Journal of Service Industry Management*, 16(3), 229-252.

Strizhakova, Y., Tsarenko, Y., Ruth, J.A. 2012. I'm mad and I can't get that service failure off my mind" coping and rumination as mediators of anger effects on customer intentions. *Journal of Service Research*, 15(4), 414-429.

Su, L., Wan, L.C., Wyer Jr, R.S., 2018. The contrasting influences of incidental anger and fear on responses to a service failure. *Psychology & Marketing*, 35(9), 666-675.

Sumarno, T.B., Sihotang, P., Prawiraatmadja, W., 2022. Exploring Indonesia's energy policy failures through the JUST framework. *Energy Policy*, 164, 1-13, 112914.

Tabachnick, B. & Fidell, L. (2013). *Using multivariate statistics*. Boston: Pearson Education.

Tronvoll, B., 2011. Negative emotions and their effect on customer complaint behaviour. *Journal of Service Management*, 22(1), 111-121.

Valentini, S., Orsingher, C., Polyakova, A. 2020. Customers' emotions in service failure and recovery: a meta-analysis. *Marketing Letters*, 31: 199-216.

Van der Merwe, S. E., Biggs, R., Preiser R., 2018. A framework for conceptualizing and assessing the resilience of essential services produced by socio-technical systems. *Ecology and Society*, 23(2), 1268.

Van De Schoot, R., Lugtig, P., Hox J., 2012. A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, 9(4): 486-492.

Weiner, B., 1985. An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4), 548.

Winkler, H., Keen, S., Marguard, A., 2020. Climate finance to transform energy infrastructure as part of a just transition in South Africa. Available at: https://zivahub.uct.ac.za/articles/report/Climate_finance_to_transform_energy_infrastructure_as_part_of_a_just_transition_in_South_Africa/12871883/1 (Accessed on 21 January 2024).

Yen, H.R., Gwinner, K.P., Su, W., 2004. The impact of customer participation and service expectation on Locus attributions following service failure. *International Journal of Service Industry Management*, 15(1), 7-26.

Yi, S., Baumgartner, H., 2004. Coping with negative emotions in purchase-related situations. *Journal of Consumer Psychology*, 14(3), 303-317.

Ye, Y., Koch, S.F., Zhang, J., 2018. Determinants of household electricity consumption in South Africa. *Energy economics*, 75, 120-133.

Western Cape Government, 2019. Load shedding fact sheet. Available at:

https://www.westerncape.gov.za/110green/sites/green.westerncape.gov.za/files/atoms/files/Load%20Shedding%20FAQ%202019_FINAL_2.pdf (Accessed 29 September 2023).

World bank, 2018. Access to Energy is at the Heart of Development. Available

at:<https://www.worldbank.org/en/news/feature/2018/04/18/access-energy-sustainable-development-goal-7> (Accessed 22 September 2022).