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Table of Contents

Name and Affiliation	Title	Page Number
Ariane-Tabea Schüller (Author) *University of Greifswald*	**A Critical Evaluation of the Impact of Giveaways on Follower-Engagement of Commercial Posts on Instagram**	**3-9**
Mariusz Michał Łaciak (Author) *AGH University of Krakow* **Szymon Gustaw Kuczyński (Co-Author)** *AGH University of Krakow* **Tomasz Wlodek (Co-Author)** *AGH University of Krakow* **Adam Szurlej (Co-Author)** *AGH University of Krakow*	**Energy Recovery in Natural Gas Regulation Stations: Analyzing Turboexpander Implementation for Electricity Generation**	**10**
Szymon Gustaw Kuczyński (Author) *AGH University of Krakow* **Mariusz Michał Łaciak (Co-Author)** *AGH University of Krakow* **Stanisław Nagy (Co-Author)** *AGH University of Krakow*	**Biogas Upgrading Techniques for Sustainable Energy: Analysis of Physical Absorption and Membrane Separation Methods**	**11**
Tomasz Wlodek (Author) *AGH University of Krakow*	**The main challenges for pipeline transport of carbon dioxide as a part of industry decarbonization processes**	**12**

Content Details:

Ariane-Tabea Schüller (Author) *University of Greifswald*	**A Critical Evaluation of the Impact of Giveaways on Follower-Engagement of Commercial Posts on Instagram**

Abstract

Many businesses harness social media influencers on Instagram to promote their products. Influencer posts are often not perceived to be advertising. Because of their authenticity and credibility, posts on Instagram have a wide reach to an engaged audience. In order to measure the success of a social media campaign on Instagram individual methods of engagement-, reach-, traffic- and sentiment-metrics are used. Due to the simplicity and cost-effectiveness of the data collection most companies prefer to use a measurement of numbers rather than of sentiment. However, quantitative metrics can lead to inaccurate conclusions about the effectiveness since they can be altered by the influencer's behavior. This study aims to identify the strategy of giveaways as an intentional manipulation of the outcome of the measurement metrics by the influencers on Instagram. The results, based on data collection form posts of 18 female German influencers during a 24 hour surveillance of 21 days, suggest that the promotional tactic of giveaways purposefully influence and boost the traditional metrics of effectiveness measurement.

Keywords: SMIs, Instagram, engagement metrics, giveawyas

Introduction

Social media has become an essential tool for businesses, and individuals to reach their target audience, promote their brands, and engage with their communities (Delbaere et al., 2021). Platforms like Facebook, Twitter, Instagram, and YouTube, among others, allow users to share their thoughts, opinions, and experiences with a large audience. Users, who accumulate a large following through a visual and textual narration of their personal life and lifestyle in posts and videos, are called influencers (Ye et al., 2021; Abidin, 2015). Their user-generated content is considered as genuine and honest insights, and therefore followers are more likely to trust these recommendations compared to brand-generated communications (Lopes & Goulart-da-Silva, 2021; Djafarova & Rushworth, 2017). Advertisers select and reimburse influencers for their sponsored content based on the engagement, as a key performance indicator (KPI), generated by their posts. The most commonly used way to measure success of sponsored content is by tracking likes, shares, comments, and followers (Gross & Wangenheim, 2022; Hughes et al., 2019; Lammenett, 2019). However, these metrics can be influenced by various factors, including the timing of the post, or the type of content, but also lotteries, personal appeals of the influencer to his followers to like, comment and/or share the content, and the bid to follow fellow influencer as well. These

methods can change the number of likes, shares, comments and followers significantly, possibly falsifying the KPI in terms of an engagement rate with the advertised brand. This research provides insights for both: advertising companies and scholars. It contributes to literature by critically reevaluating current engagement success measurements of sponsored influencer brand content on Instagram. Since its inception in 2010, Instagram has become increasingly popular as a social media platform. It is considered one of the leading social media platforms for sharing photos and videos, with high engagement rates among the users (Casalo et al., 2020). Measuring the impact of sponsored content on Instagram is essential to evaluate the success, to determine the return on investment of the social media effort, and also to be able to make well-founded decisions about future investments. Consequently, adducted metrics of success measurement should be valid, objective and without any possibility to be manipulated by the influencer.

Theoretical Framework

Social Media Influencers on Instagram

Instagram is a social media platform that enables users to share photos, videos and stories with their followers. Launched in 2010, it has since become one of the most popular social media platforms (Statista, 2023). It can be characterized as a picture-sharing, entertainment-oriented network, which is based on creative visual content (Gross & Wangenheim, 2022; Herrando & Hoyos, 2022). Users engage on this platform to interact with others through likes, comments, and direct messages. While pictures and videos can be posted permanently in the so-called feed, stories are short-lived videos or photos, which disappear after 24 hours. They provide an intimate and authentic glimpse into the life of the content creator. Instagram reels is an alternative to TikTok and lets users create, edit, and share short, engaging videos up to 90 seconds long. Overall, it is a visually-focused and highly engaging social media platform that has evolved to a popular location for both personal and business use. Social Media Influencers (SMIs) are individuals who use their popularity and credibility within specific niches to shape the opinions and behaviors of their followers (Delbaere et al., 2021). Their content resonates with their audience, because it is believed to be more credible than e.g. traditional media sources (Johnson & Kaye, 2004). They are very successful opinion leaders, who authentically share their views, experiences or daily routines. Next to the factor of credibility, attractiveness and the desire to mimic, SMIs are key indicators regarding the scope of influence on the audience (Ki & Kim, 2019; Torres et al., 2019). Brands frequently collaborate with influencers to authentically promote their products. They seek positive returns on their investments (Belanche et al., 2021) in the form of enhanced purchase intentions (Lou & Yuan, 2019), engagement (Chmait et al., 2020), brand awareness (Lou & Yuan, 2019), or recommendations (Jimenez-Cstillo & Sanchez-Fernandez, 2019). The follower count, audience engagement and reach are determining factors of the type of influencer on Instagram. The spectrum of influencers varies widely, from micro-influencers, who are closely connected to their niche audiences, to macro- and mega-influencers, who have a large and diverse audience (Conde & Casais, 2023). Micro-influencers (Haenlein & Libai, 2017), with about 1,000 to 100,000 followers,

often focus on specific niches and tend to have highly engaged and loyal audiences. Their smaller, more intimate followings allow for closer interactions, leading to stronger trust and higher engagement rates. This makes them the ideal opinion leaders for a marketing campaign which targets niche markets. In contrast, macro-influencers (Borges-Tiago et al., 2023), who typically have 100,000 to one million followers, offer a much broader reach and appeal to a more diverse audience. Although they may have slightly lower engagement rates than micro-influencers, macro-influencers are beneficial for brands looking for a wide visibility and a larger scale impact on Instagram. Content creators with over a million followers, often including celebrities and well-known public figures, are called mega-influencers (Park et al., 2021). They engage with a diverse and global audience, which makes them highly appealing to major brands seeking widespread visibility and brand recognition. Their posts often contain high-quality, professionally produced content and partnerships with top-tier brands, spanning from fashion, beauty, technology, lifestyle, and more. The sheer scale of their reach gives them an unparalleled potential for brand exposure. Due to their influence and visibility, collaborations with mega-influencers often come at a premium but can yield substantial returns for brands aiming to increase their appeal and credibility worldwide.

Social Media Impact Measurement Methods

When considering a collaboration with an influencer, it is often assumed that the number of followers translates directly into the scope of reach (De Veirman et al., 2017). But not all of the followers are regular or active content consumers and also more followers do not automatically create more interactions. Therefore, just quantitative metrics do not sufficiently and accurately measure the effectiveness of a collaboration. Content-based metrics have also to be taken into consideration. There are various methods for measuring the impact of sponsored content on Instagram (Guoquan et al., 2021; Arora et al., 2019): (1) Engagement metrics – operating figures, as likes, shares, comments and followers, that measure the potential level of interaction between a brand and its audience. (2) Reach metrics – quantify the number of people who have viewed the post or seen the reel. This can include impressions and reach. (3) Traffic metrics – measurement of the number of visitors to a website or landing page by clicks, conversions and bounce rate. (4) Sentiment metrics – positive, negative and neutral attitudes and emotions expressed by the followers. (5) ROI metrics – the return on investment of an Instagram campaign can be measured by cost per lead, cost per conversion, and customer lifetime value. These methods can be applied to different types of sponsored posts on Instagram. Short-term advertising appeals are designed to create immediate effects and benefits, such as awareness, leads or sales (Funke 2019). While long-term experience-based appeals generate lasting effects, as brand image or brand loyaltiy (Gross & Wangenheim, 2022). The promotional tactic of giveaways is widely employed to increase post engagement and drive sales (Destriyani etal. 2019). The influencer gives away a product or service via a contest setting. In order to participate, the followers need to be active on Instagram, e.g. like and comment the post, share the post in their own story, or tag friends

(Syahputra et al. 2022). On one side this method boosts metrics like shares, comments, and likes, but on the other side it may also distort the effectiveness-measurement of influencer marketing campaigns on Instagram. This paper explores the impact of giveaways on the engagement rates of commercial posts on Instagram.

Method

Dataset

This study comprises a broad quantitative analysis of the Instagram activity of 18 selected German influencers over a three-week period. Using a systematic observation technique, data was collected continuously for 24 hours each day, capturing each influencer's content type, post frequency, post timing, and engagement metrics. The goal was to identify patterns in post activity, engagement, and content type, as well as any temporal trends across the observation time. The sample comprised 18 female German influencers, purposefully selected to represent a range of follower counts, in the niche of fashion and lifestyle. The follower counts range from 8,000 to 4,8 million. Two influencers with a follower base of less than 20,000, four women with 100,000 to 450,000 followers, seven influencers in the third category of 500,000 to a million followers, and finally five mega-influencers. The data sample was collected by using observational surveillance of each influencer's public Instagram feed for 24 hours per day over the 21-day period. The first variable captured is the post type, identified as a permanent post or 24-hour-lasting story. Engagement metrics have been measured by the number of likes, comments, and shares for each post. The variable of post frequency and timing consists of the daily number of posts and the exact time each post was published. And finally, a basic thematic coding was applied to categorize content into topics: product promotion with and without a tag, community integration and content with links. To summarize the influencers' posting patterns and engagement a broad descriptive, temporal and comparative analysis was conducted.

Results

Over the 21-day observation period, a total of 5,495 Instagram posts were analyzed regarding commercial content across the selected 18 influencers. 30.2% of these posts contained advertising stimuli, of which 68% were not labeled as such. The remaining 3,835 posts (69.8%) were classified as non-commercial content. At first sight, this indicates a significant yet balanced approach among influencers, with commercial content accounting for roughly one-third of their posting activity. However, when a more specific analysis by influencer category is done, the study reveals notable variations among these categories in their commercial content approach. While micro-influencers posted the lowest proportion of commercial content, with 25.7% of their posts containing brand-related material, macro-influencers had a higher proportion with 42.1 %. This can be ascribed to their established brand partnerships. The highest proportion of commercial content was posted by the five mega-influencers, with 61.3% of their posts being commercially focused, reflecting their popularity among brands for large-scale promotions. When looking at the

numbers of the overall engagement rate on commercial and non-commercial content, a converse comportment presents itself. The fewer and niche audiences of the analyzed micro-influencers responded more actively with an average engagement rate of 4.6%, while macro-influencers achieved 3.2% and mega- influencers exhibited the lowest engagement rate of 2.7%. Commercial content was always paired with the promotional tool of giveaways, posted shortly before the giveaway announcement. The analysis showed a significant increase in engagement rates for these commercial posts. As users were typically required to comment or tag others to participate, the primary drivers of comments and shares boosted the engagement rate up to 8.5%, among all influencer-categories. This is about twice as much engagement for micro-influencers, compared to their overall engagement rate, and more than three times as much for the mega-influencers. Even though these numbers of the engagement metrics signal a prolific impact of the marketing campaign, this may not reflect genuine consumer interest or the intent to purchase. Followers engage primarily for the incentive, not necessarily because of strong connections to the brand or product. Scholars refer to this phenomenon as "incentivized engagement" (Barman & Saikia, 2024; Zhang et al., 2024). Giveaways attract temporary followers who seek prizes rather than a genuine interest in the content or brand. This false indicator of brand affinity may mislead companies into believing that their campaigns resonate with the audience. Companies risk overvaluing posts with high engagement due to giveaways, leading to misallocated marketing budgets. It is to be assumed that the brand is going to experience a spike in unfollowing and decreased engagement on subsequent posts after the campaign ends. To better assess campaign outcomes and more accurately evaluate the success of an influencers' posting efforts on Instagram, companies may benefit from tracking metrics beyond engagement, such as long-term follower growth, customer retention, and actual sales impact.

Conclusion

Using likes, shares, comments, and followers as the sole measure of the success of sponsored Instagram content is problematic, as these engagement metrics are subjective and can be manipulated by the promotional tool of giveaways by the influencer. However, since there are no other alternatives to evaluate the engagement of followers yet, a holistic approach is recommended. To get a more accurate measurement of the success, it is important to take multiple metrics into account, including reach, traffic, conversions, return on investment and long-term analysis. By using a combination of metrics, businesses can get a more comprehensive understanding of the impact of their social media efforts and make data-driven decisions about their Instagram strategies. Never the less, future research should investigate other determinants, which validate follower engagement more accurately with regard to sponsored content effectiveness. While the number of analyzed posts is sufficient, there is room for improvement among the numbers of influencers in each category.

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Energy Recovery in Natural Gas Regulation Stations: Analyzing Turboexpander Implementation for Electricity Generation

Abstract

During the transmission and distribution of natural gas to end users, gas pressure is reduced at natural gas regulation stations (GRS). The potential energy in high-pressure gas at these stations is typically lost, with most losses depending on the thermodynamic properties of natural gas before and after pressure reduction. This potential energy can be harnessed for electricity generation by replacing conventional regulators with expanders that drive an electric generator. To optimize system performance, it is necessary to heat the natural gas both before and after pressure reduction to maintain a temperature higher than that typically observed in standard pressure regulation processes. This study presents simulation results of turboexpanders operating under real-world GRS conditions, which were utilized to conduct an economic analysis. Based on these simulations, specific stations were identified where the use of turboexpanders is more advantageous compared to traditional pressure regulator stations. Key operational parameters of these stations were analyzed to establish fundamental selection criteria using real data.

Keywords*:* Natural gas, natural gas regulation station, turboexpander, expanders, energy recovery, electricity generation

Szymon Gustaw Kuczyński (Author) *AGH University of Krakow* **Mariusz Michał Łaciak (Co-Author)** *AGH University of Krakow* **Stanisław Nagy (Co-Author)** *AGH University of Krakow*	**Biogas Upgrading Techniques for Sustainable Energy: Analysis of Physical Absorption and Membrane Separation Methods**

Abstract

Global challenges related to reducing greenhouse gas emissions, and in response to the EU's intensified climate and energy policy targets to achieve climate neutrality by 2050—which were strengthened in December 2020 when the European Council decided to increase the 2030 climate goal to a minimum 55% reduction in emissions—, as well as in alignment with the national objectives outlined in Poland's Energy Policy until 2040, biogas development plays a significant role in the energy transition process.

Biogas is produced through anaerobic digestion, a process involving specialized groups of bacteria. It is classified into landfill biogas, sewage biogas, and agricultural biogas, depending on its source. The primary components of biogas are methane and carbon dioxide. Germany leads Europe in the number of operational biogas plants. Biogas is predominantly utilized for the generation of electricity and heat in cogeneration units. The upgrading of biogas primarily involves the removal of carbon dioxide to increase its methane content. Consequently, the resulting biomethane contains at least 95% methane by volume and can either be injected into the natural gas grid or used as a transport fuel. The most commonly employed biogas upgrading techniques include physical absorption using water scrubbing, chemical absorption, and membrane separation. This study presents the results of an analysis of biogas upgrading installations using the physical absorption method with water scrubbing recirculation and membrane separation technology.

Keywords: Biogas, biomethane, biogas drying, biogas upgrading, physical absorption, chemical absorption, membrane separation, water scrubbing.

Tomasz Wlodek (Author) *AGH University of Krakow*	**The main challenges for pipeline transport of carbon dioxide as a part of industry decarbonization processes**

Abstract

One of paths to reduce carbon dioxide emissions is its capture, then transport to the storage site and injection into selected geological structures. CCS technology as proven technology to stop CO_2 emissions to the atmosphere is a critical technological solution enabling a net-zero emissions industry. Moreover, CCS remains the only decarbonization solution for some industrial sectors. CO_2 transport as a key link plays an important role in CCS technology. Pipelines, as the most economical, have advantages in transporting large quantities of CO_2., which can be transported by pipelines in the gas phase, liquid phase and supercritical phase. Significant differences in the properties of CO_2 due to phase in which it is transported generate major technological challenges in its pipeline transport. The main challenges are primarily the operating pressure range for the pipeline, which is significantly different for transmission in the gas phase (2-4 MPa) and for the liquid phase or the supercritical state (8-15 MPa). The operating pressure range of operation and phase in which CO_2 will be transported determine the selection of technological solutions in the pipeline system. Additionally, material aspects and the possibility of rapid ductile fracture propagation in the pipeline with a significant decrease in temperature are a major challenge. An important issue is the stream composition of transmitted CO_2. The key challenge is to dry the CO_2 stream well enough, water left in the CO_2 stream in small amounts can significantly contribute to the formation of unstable carbonic acid, which has a strong corrosive effect.

Keywords: carbon dioxide, pipeline transport, CO_2, pipelines, CO_2 pipelines

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