Existing studies indicate that today’s consumers are interested in knowing where and how products are made, in addition to other product attributes, such as price, color, and brand name. In response to this rising demand, businesses are communicating about their sustainable practices through claims in their marketing messages to create a niche for themselves and to show that they are doing their part for social and environmental improvement. However, sustainable aspects of products are credence attributes, hence, difficult to verify by consumers. To help brands clearly and effectively communicate their sustainability efforts, the study was designed to assess how consumers process various sustainability claims from a brand when they have different prior experience with that brand (brand schemas). This study used transparency of information on the claims as well as source of claims as external cues to influence consumers’ brand schemas and influence their evaluation of sustainability claims. Two approaches were designed for data collection and analyses: (a) self-reported survey measures through an online experiment to understand consumers’ schema and their attitude towards claims, and, (b) psycho-physiological and image recognition measures through laboratory experiment study to assess consumers’ cognitive processing of various sustainability claims. Results indicated that presence of information transparency on sustainability claims does influence consumers’ schema positively and in turn attitude toward the claims. Analyses of heart rate and recognition data indicated that consumers process incongruent claims more deeply than congruent claims. They were also able to better recognize incongruent claims than congruent claims. Implications, contributions, limitations and future research opportunities are also discussed.